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Sibelius 7 Student	£245.95
Sibelius 7	£394.95
Sibelius 3 for PC/Mac is also available	
Sound module serial port driver	£37.95

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Special limited time offer	£79.00
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Mouse (Genius/STD Acorn-compatible)	£19.95
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Risc PC second slice (no PSU)	£95.00
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StrongARM & RISC OS 3.7 upgrade	£269.00
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Second hand machines and components – get them while you still can!!! :

These machines have mainly come from schools and businesses. As such there are various brandings, labels, markings, scratches, very occassional broken bits (e.g. front flaps) on the cases. All machines have been generally cleaned and air dusted inside to get rid of most of the dust, however the cases have not been meticulously cleaned as this would take a long time and increase the prices considerably. Any machines which have PC cards are usually 486 cards, but as these are basically worthless, their value has not been taken into account (and they might not have all the software on the disc to work them anyway). Get free carriage if you also take a monitor (the 'b' indicates an additional £10 carriage charge). Keyboard, mouse and mains cable included. Single slice machines do not have backplanes unless specified. Ethernet cards etc. can be taken out if not required. There is a three month warranty on these machines and they are supplied 'as seen', so to speak. All details are subject to change and please check availability before ordering.

A7000, RISC OS 3.6, 8Mb, 406Mb HD, 10BaseT ethernet card, fan	£60.00b
A7000, RISC OS 3.6, 18Mb, 406Mb HD, 10BaseT ethernet card	£60.00b
A7000, RISC OS 3.6, 20Mb, 406Mb HD, Combi ethernet card	£60.00b
A7000, RISC OS 3.6, 20Mb, 406Mb HD, Combi ethernet card, backplane & fan	£70.00b
A7000, RISC OS 3.6, 20Mb, 406Mb HD, Combi ethernet card, CD drive & fan	£70.00b
A7000+, RISC OS 3.71, 16Mb, 163Mb HD, 10BaseT ethernet card	£70.00b
A7000+, RISC OS 3.71, 24Mb, 163Mb HD, 10BaseT ethernet card	£70.00b
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A7000+, RISC OS 3.71, 16Mb, 1225Mb HD, 10BaseT ethernet card	£80.00b
A7000+, RISC OS 3.71, 24Mb, 1225Mb HD, 10BaseT ethernet card	£80.00b
A7000+, RISC OS 3.71, 24Mb, 1225Mb HD, 10BaseT ethernet card	£80.00b
A7000+, RISC OS 3.71, 24Mb, 1225Mb HD, 10BaseT ethernet card	£80.00b
A7000+, RISC OS 3.71, 24Mb, 1225Mb HD, Combi ethernet card	£80.00b
A7000+, RISC OS 3.71, 16Mb, 1221Mb HD, 10BaseT ethernet card, CD drive	£90.00b
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RPC 710, RISC OS 3.6, 36+1Mb, 515Mb HD, 10BaseT ethernet, PC card, noisy fan	£130.00b
RPC 710, RISC OS 3.6, 36+1Mb, 515Mb HD, 10BaseT ethernet, PC card, noisy fan	£130.00b
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RPC SA, RISC OS 3.7, 16+1Mb, 203Mb HD, Combi ethernet card	£280.00b
RPC SA, RISC OS 3.7, 16+1Mb, 203Mb HD, Combi ethernet card	£280.00b
RPC SA, RISC OS 3.7, 16+1Mb, 203Mb HD, Combi ethernet card, PC card	£280.00b
RPC SA, RISC OS 3.7, 16+1Mb, 406Mb HD, Combi ethernet card	£290.00b
RPC SA, RISC OS 3.7, 16+1Mb, 203Mb HD, Combi ethernet card, CD drive, PC card	£300.00b
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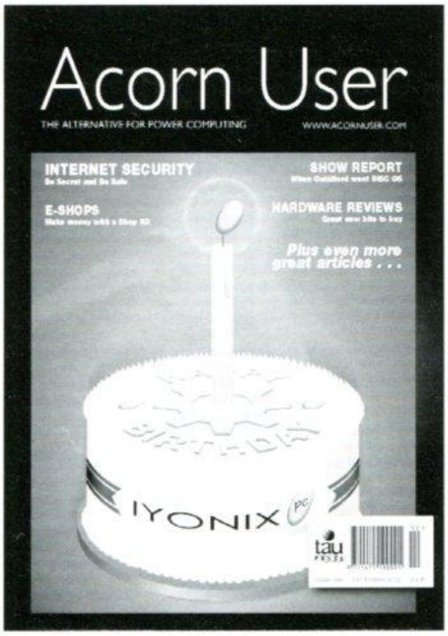
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Editor's Comments

I know it may be tedious of me but, hey, we can all be proud: We won the Rugby World Cup. And since I'm the sort of person that people would use for their sport questions phone-a-friend on Who Wants To Be A Millionaire, I take particular pride in it.

I hope it's not too contrived a jump to say that I take a pride in RISC OS as well and that fact that it is still here after all these years and after all the trouble it's been through. And there aren't many other products that could have taken the beating that it has taken with so many broken promises, from Acorn onwards.

And that, of course, is down to two things: First it is a very good product. It may not be perfect, well it isn't but then nothing is. We can suffice with "it's a very good product". And then there is you. Obviously if RISC OS hadn't been such a good product you wouldn't have stuck with it.

But you are one of those people who has stuck with it and supported the market thereby allowing companies such as Castle, CJE Micros, Stuart Tyrrell Developments (now Advantage 6) and all the rest, to have a base from which to develop.

There are, of course, those who really haven't helped. Betrayal of trust is very common in our world and I suppose we shouldn't be surprised but it does hurt.

If you read the PC computer press, which I do, you would know that the complaints against Microsoft and the way it behaves continue to increase. They are not diminishing. The security flaws that never seem to go away, the Big Brother control attitude of the company. Restrictions, corporate isolationism, it's actually quite appalling what they are doing.

And there is corporate and governmental unrest. Microsoft has too much power and it is continually trying to grab more. It doesn't cooperate, it dominates.

Linux is one option that people look at, but although certain companies have taken the plunge it is a difficult area. By it's open nature Linux is resistant to commercial exploitation. Some consider this to be a good point and, of course, it is. But it is also a barrier.

In the Far East there is talk of developing a new operating system from scratch to challenge Windows, simply because they don't like having Microsoft controlling their businesses.

And here we are with a mature operating system (which admittedly could do with some work) in a market that works cooperatively. Perhaps it's another game we could play successfully. It's worth thinking about.

Rob Donaldson (aueditor@acornuser.com)

Risc PC to cease production

Castle Technology Ltd has announced that after nearly ten very successful years the Risc PC is shortly to cease production. Once current Risc PC supplies have been exhausted the RISC OS market will be based on the Acorn A7000+ and Iyonix PC, both produced exclusively by Castle, and other RISC OS machines from independent manufacturers.

The Risc PC was announced by Acorn early in 1994 and went on sale in the spring of that year. At the time it was the world's fastest desktop computer based on RISC (Reduced Instruction Set Computer) technology. Originally using the ARM610 processor this was subsequently replaced by the ARM710. A major step forward came with the advent of the StrongARM processor in the autumn of 1996 giving a significant boost in performance. The StrongARM processor remained the basis of the Risc PC from then on.

After Acorn pulled out of the desktop computer market in September 1998 Castle took over the production of the Risc PC and A7000+ computers, and RISCOS Ltd released RISC OS 4 the following year. In the autumn of 2002 Castle announced the all-new Iyonix PC, running on an XScale processor and with the new RISC OS 5.

Given the short lifespans of so many other computers it is a striking affirmation of Acorn's original design for the Risc PC that it has remained at the centre of the RISC OS world for nearly ten years. Customers benefited from a string of upgrades that meant the Risc PC could be continually upgraded to the latest specification.

With the successful launch of the Iyonix PC, now a year old, it will have been obvious to market watchers that the Risc PC could not continue indefinitely. The time has now arrived when no more Risc PCs will be manufactured, but RISC OS will continue on the Iyonix PC, now the preferred platform of choice among RISC OS users.

Jack Lillingston said, "The demise of the Risc PC is the end of an era. It has served the RISC OS market for an incredibly long time and proved a wonderful tool for those who appreciate RISC OS systems. The increasing difficulty in obtaining components and its relative lack of speed in today's demanding markets, make it no longer viable. As far as Castle is concerned the future of RISC OS computing now lies with the Iyonix PC and the continuing development of RISC OS 5. Nevertheless, the Risc PC will be greatly missed for what it has allowed users to achieve during its long lifetime."

MicroDigital to face legal action?

More and more individuals are finding it necessary to resort to legal action to reclaim the advanced payments given to MicroDigital Ltd for their Omega computers promised years ago. One individual, who wished to remain anonymous, stated: "I need my money back. I have asked politely on several occasions for a refund but I haven't got it. I'm having to go to the Small Claims Court now, I really didn't want to but I have no choice."

The level of goodwill for MicroDigital still seems astonishingly high, considering the years of delay in actually providing the product in sufficient quantities to supply the long-standing orders. We did not ask David Atkins of MicroDigital to comment since he has publicly declared his unwillingness to talk to the Acorn press, however if he wishes to respond on the subject of refusing to refund, we would be interested in publishing his justifications.

Rob Donaldson

User group meetings

Southampton Acorn Users Group meeting: Monday December 8th, 19:00 until 21:00, Room S1, Itchen College, Middle Road, Southampton. Admission free; all welcome. Topic TBA.

The November meeting of BARUG is to be held on Wednesday 26 November 03 at 19:30 in the usual venue (see **www.barug.co.uk** for details). The guest speaker is Paul Middleton, MD of RISC OS Ltd, who will be explaining where he sees RISC OS going and updating his audience on developments in the Foundation/Select and so on.

The RISC OS User Group of London (ROUGOL) meets on the third Monday evening of every month, at The Blue-Eyed Maid, 173 Borough High Street, London SE1 1HR. The December meeting will be informal, taking a look at SCSI setup, Artworks 2 and Ovation Pro. January sees a presentation of AppBasic by its author Joe Taylor, and in February Richard Brown from Oregano UK Ltd will visit the group. Admittance and membership are free. For more information, email **info@rougol.jellybaby.net** or phone 07876 035495.

The RISC OS North West User Group (RONWUG) continues to meet at the Trafford Metrovick Rugby & Cricket Club, Finnybank Rd, Sale, Cheshire M33 6LR on the third Wednesday evening of each month. Admittance and membership are free. For more information, email **info@ronwug.org** or phone 0161 969 9820.

Xmas offers and more from STD

It's been a busy month or two at STD, with some Christmas offers, updated software and free release of the keyboard drivers.

First off, Stuart Tyrrell Developments are offering special Christmas offers on Simtec USB cards and peripherals. They are offering a Christmas discount on the USB card, and two packs including Digiflash card readers.

All orders placed for the Simtec USB card before 24th December will be offered at a discounted price of £79 inc VAT and carriage (normal price £89inc).

For those of you with a digital camera or PDA, a special offer pack comprising of Simtec USB card and DigiFlash2 card reader is available at £99 inc

A Simtec USB card along with a DigiFlash7 is priced at £119inc. These offers are valid for orders placed before 24th December 2003, and are subject to availability.

The Simtec USB card is a USB1.1 compatible USB expansion card for RISC OS computers fitted with a backplane. It allows for connection of USB devices such as keyboards, mice, pen drives, MP3 players, scanners, cameras and USB wireless networking dongles.

Further information about the Simtec USB card may be found at **www.riscos-usb.com** and at **www.stdevel.com/USB.html**

DigiFlash are a series of card readers for use with the Simtec USB card and stack. They are provided with software, which provides full read/write access to cards.

DigiFlash2 enables SmartMedia and type-1 Compact Flash cards to be both read and written to. DigiFlash7 adds type-2 Compact Flash, MicroDrive, MMC, Secure Digital and Memory Stick. Further information about DigiFlash2 and DigiFlash7 may be found at **www.digiflash.co.uk**

STD are also offering their extendable drivers for MultiMedia Keyboards free of charge from their Web site.

The drivers, as supplied with our own MultiMedia Keyboard, are suitable for most current multimedia PS/2 keyboards, and may easily be modified to support extra functions as necessary.

They are suitable for use on RISC OS machines fitted with a native PS/2 port, such as the Risc PC, A7000 and Omega.

!STDMMK enables functions to be associated with multi-media keypresses, for example shortcuts for WebsterXL web browser, CD controls, volume and so on.

The drivers may be used freely by any individual who downloads them from the Stuart Tyrrell Developments Web site, although please note that the license conditions preclude distribution by any other means and the software is offered without support or warranty.

Finally, STD have also updated their Wireless Access Point control software, !MWAP. !MWAP SNMP control software enables simple configuration of Wireless Access Points and other suitable devices purchased from STD.

This upgrade of the SNMP client takes account of new developments to support further classes of devices, and allows for simple downloadable upgrades in the future.

Existing customers should note the serial number of their installation (which may be read from the "Info" window), and complete the form at **www.stdevel.com/snmp.html**

Further details regarding our current range of Wireless networking solutions may be found at: **www.stdevel.com/wlan.html**

Stuart Tyrrell Developments, PO Box 183, OLDHAM, OL2 8FB; Tel: 0845 458 8803 / 01706 848 600; Fax: 0870 164 1604; Email: **info@stdevel.co.uk**; Web: **www.stdevel.co.uk**

Riscstation offer portable at last

Riscstation have ended many months of silence and written to customers who have placed deposits (or in some cases, full purchase price) on their planned RISC OS laptop.

Riscstation will no longer be producing an ARM-based laptop, but will be offering one of several "off the shelf" Intel/AMD based laptops running Windows XP and VirtualRisc PC.

They are offering four possible options. All come with VirtualRisc PC and RISC OS 4 pre-installed.

Option One: Celeron 2.0Ghz Processor; 256mb Memory; 20gb Hard Drive; CD Drive; Internal Floppy Drive; Modem; Networking; 14.1" Screen - 1024x768 resolution; On board 32mb Graphics; Built in - (S-Video); Firewire; On board Sound; Microsoft Windows XP Home Operating System; Virtual Acorn RPC-SE (including RISC OS 4); Linux and Software Suite; 1 year collect and return warranty *; Cost £777.00 without VAT £912.98 inc. VAT

Option Two; AMD Athlon 2000+ Processor; 256mb Memory; 30gb Hard Drive; DVD/CDRW Combo Drive; Internal Floppy Drive; Modem; Networking; 14.1" Screen - 1024x768 resolution; On board 32mb Graphics; Built in - (S-Video); Firewire; On board Sound; Microsoft Windows XP Home Operating System; Virtual Acorn RPC-SE (including RISC OS 4); Linux and Software Suite; 3 years collect and return warranty *; Cost £964.00 without VAT £1132.70 inc. VAT

Option Three; Intel Pentium 4 2.4Ghz Processor; 512mb Memory; 30gb Hard Drive; DVD/CDRW Combo Drive; Internal Floppy Drive; Modem; Networking; 15.1" Screen - 1024x768 resolution; 64mb ATI Graphics; Built in - (S-Video); Firewire; On board Sound; Microsoft Windows XP Home Operating System; Virtual Acorn RPC-SE (including RISC OS 4); Linux and Software Suite; 1 year collect and return warranty *; Cost £1172.00 without VAT £1377.10 inc. VAT

Option Four; Intel Pentium 4 2.66Ghz Processor; 512mb Memory; 30gb Hard Drive; DVDRW/CDRW Drive; Internal Floppy Drive; Modem; Networking; 15.1" Screen - 1024x768 resolution; 64mb ATI Graphics; Built in - (S-Video); Firewire; On board Sound; Microsoft Windows XP Home Operating System; Virtual Acorn RPC-SE (including RISC OS 4); Linux and Software Suite; 1 year collect and return warranty *; Cost £1265.00 without VAT £1486.38 inc. VAT

Option Five: Intel Pentium 4 2.66Ghz Processor; 512mb Memory; 80gb Hard Drive; DVD/CDRW Combo Drive; Internal Floppy Drive; Modem; Networking; 17.1" Screen - 1280x1024 resolution; 64mb SISM650 Graphics; Built in - (S-Video); Firewire; On board Sound; Microsoft Windows XP Home Operating System; Virtual Acorn RPC-SE (including RISC OS 4); Linux and Software Suite; 1 year collect and return warranty *; Cost £1209.00 without VAT £1420.58 inc. VAT

Option Six: Intel Pentium 4 3.06Ghz Processor; 512mb Memory; 80gb Hard Drive; DVDRW/CDRW Drive; Internal Floppy Drive; Modem; Networking; 17.1" Screen - 1280x1024 resolution; 128mb ATI Graphics; Built in - (S-Video); Firewire; On board Sound; Microsoft Windows XP Home Operating System; Virtual Acorn RPC-SE (including RISC OS 4); Linux and Software Suite; 1 year collect and return warranty *; Cost £1636.00 without VAT £1922.30 inc. VAT

* Extended warranties are available

www.riscstation.co.uk

Font Directory Pro for RISC OS 5

Adrian Look has released a downloadable version of the highly acclaimed font management software. The software works on all RISC OS computers from 3.10 onwards.

Thanks to Stefan Bellon, Font Directory Professional is now 26/32 bit neutral, working with StrongARM and XScale processors. New icons have also been added by the designer of the RISC OS 5

32bit Iyonix-compatible upgrades now available - please phone!

All products are compatible with StrongARM and RISC OS 4
Some products are enhanced for RISC OS 4
All prices include VAT and UK carriage (where applicable)

HERE IS THE NEWS...

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R-Comp

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Please note - All prices include VAT and UK carriage

Data Power 2

We have taken over development of the leading DTP-style, RISC OS databases - DataPower 1 & 2. Extended CD releases have been produced (removing the old credit-based protection system) and brand new 32bit versions. The CD includes the latest release, plus online manuals and lots more.

DataPower 2 CD version £99
DataPower 2 CD + printed manual . . . £125

Upgrade to CD for existing DP2 user . . £25
32bit upgrade for existing v2 owners . . £40

DataPower Home CD version £49
DP Home for existing v1 owners £25
Image Outliner (26/32bit) £17.50

Web Authoring

HTMLEdit 5 Studio (Whole Suite) . . . £115
HTMLEdit Studio contains:
HTMLEdit V5 . . . . £55
WebsterXL £30
Web Designer's Toolkit v2+ £30
WebSpell (HTML-aware spelling checker) £15

Also Available:
SiteMaster 2+ £35

Internet Utilities

R-Comp Internet Suite £75
First class software to get you online!
Consists of DialUp 2, Messenger Pro 2 & WebsterXL (described below).
Available with a 56k Modem and Account for £115.

DialUp v2 **£25**
Internet connection software
NB. £20 to MPro owners, or £15 if you own WXL

Upgrade from DialUp v 1 for **£12**

Messenger Pro 2 **£37**
- Easy to set up and use,
- Flexible view options
- Offline and Network (£45) and Server (£100)

WebsterXL **£30**
- Support for advanced Web technologies
- Support for frames, tables, CSS and JavaScript
- Includes 128-bit SSL —shop with confidence!
- Uses plug-ins to support Java, Flash etc.

Grapevine
The definitive Internet chat software to communicate via MSN and IRC!
£25

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R-Comp Interactive

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Network-in-a-Box

New Price!

Network-in-a-Box gives you all you need to network up RISC OS and Windows computers, and share printers/internet. Containing 2 network cards, cables, the Internet/Print sharing box, software and ***5 printed, step-by-step manuals*** covering both RISC OS and Windows. **£250**

ADSL-in-a-Box

New Price!

Similar to above, but for ADSL and without the shared printing. Everything you need to network a RISC PC/A7000 and Windows PC for ADSL **£230**

UniPrint NEW - out now!

"Universal" Network Printer Driver . . . £40
The software allows your RISC OS machine to print to any printer connected (and working) to a WindowsPC on your network. That £50 USB inkjet or expensive **Photo** Printer? No problem. UniPrint solves your RISC OS printing problems.

UP VAcorn/PCcard & UP Deluxe . . £25/£50
The Virtual Acorn version allows VA to print (and the Alpha portable), and allows printing via PC card. "Deluxe" includes both standard UniPrint and the VA version, plus Sprite printing.

More Cable broadband and ADSL items available at new lower prices!
http://www.rcomp.co.uk/

Pre-Christmas Offer! ---->

100Mbit Net Card OFFER!

High speed 10 and 100Mbit card £79

T·E·K

THE REALTIME STRATEGY GAME

£30

TEK is available now!



RISCube Computers



They're Small. They're Powerful.
They run RISC OS
(and WindowsXP). 'Nuf said.

This page is yellow, so that you can't say you didn't see it!

*Definition: **Normal Computer***
Beige box, often in tower format, around 2 foot tall.
Depending on make/model likely to do a reasonable impression of a small jet taking off
May be seen in a "desktop" configuration, still beige, still about 2 foot wide.
Location: Forcibly stored in offices or back bedrooms, where they cannot frighten children or small animals

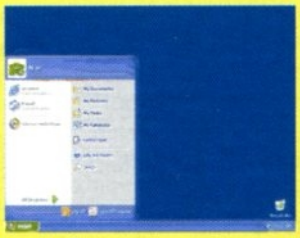
*Definition: **RISCube***
About the size of a stout shoebox
Brushed aluminum look, not out of place next to VCR, TV or Hifi.   Low noise due to innovative cooling
Location: Anywhere you like! Easily portable around the house or to/from work, due to small size and low weight

Now that the formalities are over with, let us introduce you to your new friend. The systems have been designed to offer high levels of performance yet be small, unobtrusive and attractive. Amazingly, you can enjoy style and small size, while still having the kind of cutting edge speed that would make a teenage gamer drool!

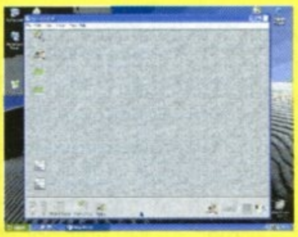
RISCube machines are primarily designed to run two operating systems - RISC OS 4.02, and WindowsXP. Both operating systems are supplied in their entirety to ensure compatibility and reliability.



RISC OS 4.02



WindowsXP



Best of Both Worlds

When you turn a RISCube on, you have a choice - RISC OS or Windows. If you select the RISC OS option, you boot straight into the RISC OS desktop, ready to run your software at StrongArm speeds and beyond!

But of course, sometimes you may wish to boot into Windows. Perhaps your kids have games which only work on Windows, or you need to use special services which aren't RISC OS compatible. It's like having two complete computer systems, but for the price of one!

All machines come with networking as standard, plus 5.1 surround sound, USB/Firewire etc. Each machine is hand-built, and pre-configured to order. Latest drivers are installed, and rigorous testing is applied to ensure it performs to its best.

Prices start at £699 Including VAT and UK delivery!

Call us on (+44) 01925 755043 or go to http://www.rcomp.co.uk/ to take the next step...

RComp Interactive

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E-mail: rci@rcomp.co.uk or check out http://www.rcomp.co.uk/
Phone: (+44) (0)1925 755043   Fax: (+44) (0)1925 757377

icons, Richard Hallas.

There is also a new Web site, where you can purchase the software, download the latest releases, browse the wealth of on-line documentation, and ask for technical support:
http://riscos.looksystems.org.uk

The cost of Font Directory Professional has been dramatically reduced to £15 (the original RRP was £65). Upgrades for existing users cost just £10.

For more information check out the FAQ, Information Sheets, and on-line User Documentation:

http://riscos.looksystems.org.uk/wiki/FontDirectoryFaq

http://riscos.looksystems.org.uk/wiki/FontDirectoryDocumentation

http://riscos.looksystems.org.uk/wiki/FontDirectoryReviews

1000th NET100 special offer

Coinciding with the production of the 1000th NET100 network card, Simtec Electronics, in association with NET100 partners Stuart Tyrrell Developments and R-Comp are offering a special deal on NET100 cards.

To celebrate this milestone, each NET100 purchased before the 24th December 2003 from a NET100 partner will be discounted by 1000p (ie ten pounds). The discounted price of the card is reduced from £89 inc VAT and UK carriage to only £79 inc.

Commenting on the production of the 1000th card, Andrew Rawnsley of R-Comp Interactive said, "When the Net100 project was originally devised, we wanted RISC OS users to have high speed networking at an affordable price, without sacrificing quality.

Since it was difficult to gauge demand for RISC OS networking products, several companies worked together to ensure that the project could be a success. The 1000th card is symbolic of the fact that co-operation in the RISC OS market works for all involved, and that the market is in a stronger state now than it has been for a while. Here's to continued growth, and the next 1000 cards!"

Stuart Tyrrell, of Stuart Tyrrell Developments said "It's amazing – the sales figures of the NET100, along with our other products, show without a doubt that the core RISC OS market remains buoyant. We've shown that a policy of full ground-up design leads to products which are understood and supported by their development partners, with performance and reliability second to none. We are delighted to continue to work with Simtec and R-Comp on this and other projects, and pleased that we can celebrate the success of the product in this manner. We don't need to extol the virtues of NET100, our customers are doing that for us!"

NET100 is a 10/100BaseT full/half duplex network card available for Risc PC and A7000 series machines. It comes complete with all drivers, including Simtec's exclusive BOOTP client.

The NIC interface, designed and manufactured by Simtec on behalf of the NET100 partners offers a highly integrated solution, drawing on Simtec's expertise of high-speed multi-layer PCB design, preferred status with device suppliers and continued commitment to the RISC OS market.

The interface is fully FLASH upgradeable and allows users to add almost 500KBytes of their own modules to the FLASH memory if they wish. An asymmetrical 16K packet buffer reduces receive overruns and can cut interrupt overheads by a factor of 3 times when compared to cards with smaller buffers, leading to favourable results in independent speed tests. The 4-layer board, automated SMT assembly and custom laser-cut metalwork are indications of the high build quality demanded by the

NET100 partners, and is typical of Simtec's products for the RISC OS and embedded markets.

R-Comp Interactive, 22 Robert Moffat, High Legh, Knutsford, Cheshire WA16 6PS; Tel: (+44) (0)1925 755043; Fax: (+44) (0)1925 757377; E-mail: **rci@rcomp.co.uk**; Web: **www.rcomp.co.uk**

Stuart Tyrrell Developments, PO Box 183, OLDHAM, OL2 8FB

New chairman for AAUG

The Association of Acorn Usergroups has announced a new leader to take the AAUG forward into 2004 and beyond. Dan Shimmin, or known to most as simply "dgs" will be taking over Neil's role as AAUG chairman with immediate effect.

Launched in 1997 by Neil Spellings, the AAUG has grown to be the definitive "umbrella" organisation for Acorn and RISC OS user groups globally.

Explaining his decision to step down as AAUG Chairman, Neil states "Over the past six years the AAUG has been enormously successful in achieving its original goals of promoting user group membership, raising their profile in the media, and getting representation at the regional shows. However, over the past 12 months the AAUG hasn't received all the attention it deserves, in maintaining the global user group directory and Web site.

"Our active RISC OS software development projects like Aemulor and Cino have meant the AAUG also hasn't received adequate representation at recent RISC OS shows, so I think its time to hang up the towel and find a new leader to take the AAUG forward. We are entering a new era for RISC OS, with new 32-bit hardware, RISC OS running on PCs under emulation etc, so the role of the usergroup is still as important as it was 5 or 10 years ago, especially if RISC OS users now have to battle with the likes of Windows XP as well."

DGS has been instrumental in the creation of at least two new user groups over the past few years, and is involved with at least another three, so is an ideal candidate to take on the role.
Commenting on his new role, Dan states "I'm delighted to be taking over as Chairman of the Association, which plays such an important part in the RISC OS market. My first priority will be helping to ensure that groups are able to provide up-to-date information (through the AAUG Web site as well as other channels), as well as helping to encourage newer groups to get going. It is almost always a myth to believe that there just aren't any other RISC OS users in your part of the world!"

People who use the aaug.net email redirection services are unaffected by this announcement, as AAUG.net domain will continue to be hosted by Spellings Computer Services Ltd for the foreseeable future who will still offer the redirection services, free to clubs and for a small free for user group members and the general public.

The AAUG was formed in October 1997 in the "golden days" of Acorn. A Web site was set-up, along with e-mail mailing list for all the user group committee members. Before the cancellation of the Phoebe project, the AAUG had negotiated discounts from Acorn for all user group members, and coordinated a successful user group tour of the infamous yellow Risc PC replacement.

The AAUG maintains a Web site of all the groups globally, a discount scheme for club members to get discounts from a range of companies, and a regular column in Acorn User with user group meetings and events news. Since its creation, the AAUG has been represented at virtually every UK Acorn show by its chairman, often travelling distances greater than many commercial exhibitors who use the distance as an excuse not to attend!

www.aaug.net

Grapevine upgrade

RComp have released a minor upgrade to their Grapevine instant messaging client for RISC OS. This is an important new version, containing a significant "security update" that moves users to a much more secure and compatible SSL-based login procedure. Although this may sound minor, it is important that users move to 1.15 quickly as this is likely to become mandatory very soon. MSN are changing their back-end access method, which could potentially render earlier versions unable to connect.

Registered Grapevine users will have received this update by email already. If you have not received your upgrade yet, contact **rcomp@rcomp.co.uk**

New C compiler

Castle have released an upgrade the their Norcroft C compiler, now at version 5.54. It is now available for download to owners of the AcornC/C++ tools suite from Castle, together with updated libraries. Please see **www.iyonix.com/32bit** for more details.

A later version of the SharedCLibrary is also available. This is applicable to all current versions of RISC OS, and is required to add support for the host of additional maths functions available within the new compiler and libraries.

Wireless RISC OS

CJE Micro's are now able to supply 802.11g Wireless Network Access Points suitable for RISC OS computers. The device connects a Risc PC/A7000 and so on, via an Ethernet interface to a wireless network. No USB interface is required.

The 802.11g Wireless Access Point (WAP) connects to your hub or Ethernet interface of your computer and lets you join your wireless-equipped computers to your wired network. It is based on breakthrough 54g technology that makes wireless file transfers and downloads faster than ever before. 54g technology provides you with networking speeds nearly five times faster than the current Wi-Fi (802.11b) standard.

When connected to a gateway, the WAP can increase your network's coverage area and allow you to take advantage of expanded wireless roaming capabilities. Once you've done the simple setup, you can share data and peripherals, as well as a single Internet account among all your computers.

The Access Point uses the wireless 54g 2.4GHz standard to offer you the widest working range-up to 1500 feet -and greater interoperability in mixed networking environments. 54g technology is backward-compatible with the 802.11b Wi-Fi networking standard, so it allows you to implement faster wireless technologies in combination with existing 802.11b Wi-Fi networks. An added Turbo Mode feature isolates your network from 802.11b wireless clients and allows your network to transmit data at the highest 54g data rate, 54Mbps.

Advantages:

Adds wirelessly networked PCs to your wired network, or extends the coverage range of your wireless networking environment

Extends your 802.11b or 54g wireless network

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Features wireless 64- and 128-bit WEP encryption

Features

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Works with RISC OS, Macintosh® and PC computers

Comes with Lifetime Warranty

Use two 54g WAPs and connect two Network interfaced RISC OS computers or one RISC OS computer to another wired network or two wired networks. 54g Wireless Network Access Point £140 inc VAT & UK Delivery (exceptions apply).

CJE Micros / NCS / 4D, 78 Brighton Road, Worthing, BN11 2EN; Tel: +44 01903 523222; Fax: +44 01903 523679; E-mail: **sales@cjemicros.co.uk**; Web: **www.cjemicros.co.uk**

Multi-processor ARM

NEC Electronics and ARM will co-develop and co-market next-generation multiprocessor-based CPU cores for home and automotive multimedia applications, and mobile handset markets.

The collaboration includes the co-development and marketing of a next-generation multiprocessor core based on Symmetric Multi-Processor (SMP). SMP (Symmetric Multi-Processor) consists of

identical processors connected symmetrically. A SMP-aware Operating System is required which will then automatically balance the processor loads by migrating tasks among processors, and achieves high-performance scalability with existing programs developed for non-multiprocessing system technology.

The strategic collaboration is aimed at extending the two companies' businesses within application-rich domains by leveraging the broad range of software developed for the ARM® core family and the multiprocessing technology from NEC Electronics. Unfortunately, RISC OS is not a SMP aware operating system.

The next-generation CPU core is a high-performance embedded multiprocessor applying a leading-edge parallel processing technology and delivering better power efficiency than conventional CPU cores. ARM and NEC Electronics will also jointly develop software for the next-generation CPU core.

"Our partnership with NEC Electronics is a very significant endorsement for the ARM architecture, and will further strengthen momentum for the ARM11 technology in NEC Electronics' key sectors of automotive and home multimedia, and wireless," said Warren East, CEO, ARM. "By collaborating with a global leader such as NEC Electronics, ARM is creating a new generation of high-performance solutions for media-rich consumer applications."

"We view this next-generation processor core as a key technology to expand the application-rich markets from car multimedia to mobile consumer," said Hirokazu Hashimoto, executive vice president, NEC Electronics Corporation. "The core will be a combination of NEC Electronics' multiprocessing technology and the ARM core architecture, which is widely deployed in various products including mobile handsets. The co-development and co-marketing by the two companies will greatly accelerate the introduction and promotion of this key innovative multiprocessor technology."

Under this agreement, NEC Electronics has licensed the ARM11 family as well as ARM966E-S™ core and the VFP9™ vector floating-point co-processor. The company has been an ARM Partner since 1995 with the ARM7TDMI® core license, and followed this in 2000 with a license for the ARM946E-S™ core for use in mobile handsets.

VirtualRPC-SE Networked

The new network-aware version of VirtualRPC-SE is now shipping to customers. The network version of VirtualRPC-SE has been in testing for some time and was on show at the RISC OS South East Show on the 18th of October. This new version adds the following features over the older non network aware VirtualRPC-SE:

Networking support plug-in including an upgraded Boot sequence

Access the Internet from within RISC OS, browse the web, FTP, send e-mails and so on

Connect VirtualRPC-SE to "real" Acorn machines over ethernet using ShareFS

Connect multiple PCs running VirtualRPC-SE over ethernet using ShareFS

Long file name support under ShareFS

Includes a number of sample programs including FTPc, FreeTerm and a demo version of Oregano2

Includes a new manual with a comprehensive networking chapter

VirtualRPC-SE now also ships with both WebFX3D and SiteWriter (worth over £60) from Dansoft Developments. Existing customers using VirtualRPC-SE on a PC, or the MicroDigital Alpha can download a free upgrade from the downloads section of the VirtualAcorn Web site. This upgrade will add networking functionality to existing VirtualRPC-SE installations.

www.virtualacorn.co.uk

Cino wants users' opinions

The team who are working on the Cino DVD player are asking users what they would like them to work on first. Given Cino consists of several parts: a DVDFS filing system; the software player; and PCI sound card driver. The team would like to know what people would find most useful to work on first. A poll has been setup on the Cino support Web site at **http://support.cinodvd.com**

Flowing water power

Canadian researchers claim to have developed a battery driven by flowing water, the first new way of generating electricity in over 160 years. This technology, built around an "electro-kinetic" effect, could provide a new power source for devices, such as mobile phones or calculators, that could be charged up by pumping water to high pressure. Although the power generated from a single channel is extremely small, millions of parallel channels can be used to increase the power output. The team illuminated a light bulb using just a few micro channels.

Bounty for virus writers

Microsoft offered two $250,000 rewards for information leading to the arrest and conviction of those responsible for the Blaster worm and the SoBig.F e-mail virus. They infected more than half a million Windows-based computers, crashed thousands of systems, and snarled Internet traffic across the globe in August and September. Microsoft also said it had earmarked an additional $4.5 million for future rewards. Internet users can send tips to any FBI, Secret Service, or Interpol office. Many of the most damaging viruses have spread through security holes in Microsoft products.

Stick your finger in your ear

NTT DoCoMo is developing a wristwatch phone that works by transforming the user's finger into an earpiece. The prototype gadget, Finger Whisper, consists of a wristband that converts digital signals into vibrations that are transmitted into the bones of the hand. The user puts his finger into his ear for the vibrations to be picked up by the eardrum. To talk, he or she speaks into a microphone on the wristband. By touching forefinger to thumb, the user starts or ends a call, and uses voice recognition technology to dial the number. There is no keypad.

RISC OS DVD

As you may of read in last month's news pages, we are producing the first ever DVD Player for RISC OS. This is no simple task; as you will see in the following article; I will lead you through some of the tasks, both technical and commercial, required to achieve our goal of watching a DVD under RISC OS.

I will also delve into the DVD Video format a little; explaining the route raw binary that sits as optical dots on a plastic disc takes to end up as the deafening explosions and high quality video for your entertainment.

The platform

The first decision was deciding which platforms to support. There are many combinations of RISC OS hardware "in the wild" but, at present, only one which can offer the computing power required to accomplish the task in hand. The Iyonix PC from Castle contains the fastest ARM CPU on any RISC OS machine at present, combined with its enhanced graphics capabilities and fast IDE interface makes it an ideal launch platform for DVD on RISC OS.

As you will see later in this article, the number of stages required to obtain audio and video mean earlier RISC OS machines such as the Risc PC, even with a StrongARM fitted are just not up to the task.

DVDs

DVD Video's are really just DVD-ROM discs containing special audio/video files that hardware and software DVD players recognise. These VOB (Video OBject) files can be up to 1Gb in size, so your average feature film is split into four of them, while special features and extras are often contained in separate VOB files. There are many other types of files associated with DVD navigation and menus, but these are quite technical and are outside the scope of this article so I won't cover them here.

Video

Video data exists as one stream of data compressed according to the MPEG-2 video format. The maximum bit rate is 9.8 Mbps, and the stream supports variable bit rate to provide high-quality video at the best possible compression ration. This means that during scenes where there isn't much happening on-screen, the bit-rate used to encode will be much lower, reducing the space required to store that particular scene. Conversely, when a scene contains a lot of action, a higher bit-rate will be used to ensure all the action is captured in the MPEG stream without losing any information (introducing "artefacts" as they are known).

DVD-Video is compatible with both NTSC and PAL formats, and supports both 4:3 and 16:9 aspect ratios. The DVD disc creator can specify either "pan & scan" (cutting off a portion of the image) or "letterbox" (showing then entire image with black bands at the top and bottom of the screen) format to provide output of 16:9 aspect ratio video content at an aspect ratio of 4:3

Audio

Four audio formats are allowed by the DVD specification: linear PCM, Dolby Digital, MPEG audio and DTS. Each title can have up to eight audio streams. Each stream is comprised of multiple channels. For instance, the Dolby Digital format supports 5.1 channels. The different audio streams are often used to hold audio in different languages, and commentary tracks from the director and cast. The viewer can select between audio tracks as they are watching the video.

Sub-picture data

What we know from DVD menus as subtitles are actually called sub-picture data. They are overlaid as a bitmap onto the main video content. This data is compressed using run-length encoding. Up to 32 streams of sub-picture data can exist for each title. Sub-picture data can be displayed in up to 16 different colours. For applications such as subtitles, the user controls the display of sub-picture data. DVD also supports the forcing of sub-picture data display, for example if the title creator wants to force a menu to be displayed at a particular point in the content stream.

DVD Data discs are really like high-volume data CDs, and are a dual format of ISO9660 and UDF filing systems (known as UDF Bridge) Cino will contain a DVDFS filing system module akin to CDFS which can understand the disc format of a DVD and read data from it.

Standards standards standards...

As the saying goes: the great thing about standards is that there are so many to choose from. The area of DVD luckily isn't that bad, as most of the components involved have agreed and ratified to a single standard which all companies producing DVD-ROM drivers, players, and the DVD Videos themselves should adhere to.

The problem is that there are just so many "parts to the equation" and each has its own, and in some cases several, standards defining that particular part. Here are just some of the standards we are working to:

DVD-ROM file format

UDF (Universal Disc Format) – how the filing system is organised on the media.

ATAPI drive command specifications – how the computer controls the DVDROM drive to read data, skip tracks, eject discs and so on.

MPEG layer 2 video compression standards – how the video is encoded and compressed

MPEG layer 2 stream extension standards – how the audio, video, subtitles and whatever else, are all combined into a single VOB file on the DVD.

A52 AC3 audio (aka Dolby Digital) compression standards – how multi-channel (5.1) surround sound is encoded into a single stream inside the VOB file.

ECMA DVD 120mm DVD Read Only Disc 3rd Edition – how the data is physically stored on the small plastic disc we all know as a DVD.

The above standards are ratified by a whole range of different organisations including: ISO (International Standards Organisation); IEC (International Electrotechnical Commission); ANSI (American National Standards Institute); INCITS (InterNational Committee for Information Technology Standards); OSTA (Optical Storage Technology Association); ECMA, MPEG Licensing Authority; ATSC (Advanced Television Systems Committee).

It took several weeks of research just to obtain all the relevant documentation before coding could even begin.

Licensing

Many of the above standards are publicly available, or can be purchased for a fee. There are only two components of the project which have chargeable licensing – the use of the MPEG format and DVD Logo certification.

The former covers patents owned by a range of companies including Sony, Phillips, and some educational institutions. The licensing involves payment of royalties to MPEG LA, the company setup to control the use of MPEG patents globally for each DVD player, disc or decoder sold.

The DVD Logo certification program is run by the DVD Format/Logo Licensing Corporation (DVD FLLC) who control the overall DVD format. They charge a fee for obtaining the DVD specifications; another for joining their program; and more to perform compulsory verification tests to ensure your product meets the required specifications before allowing you to use the DVD logo branding.

Components of a DVD Player

We will now take a brief look at the various stages required before your DVD Video can be watched on your RISC OS desktop.

1. Drive authentication

Before anything meaningful can be read of the DVD ROM drive, the drive must authenticate with the operating system software. This is done using a public/private key exchange. Also, the region code selection is performed at this point; to ensure that the region of the drive matches that of the disc you are trying to play.

2. Data request

Cino requests a block of data from the DVD-ROM Drive using ADFS which performs the transfer over the IDE bus.

3. Data decryption

Most films on DVD-Video are encrypted to prevent copying. This data is not encrypted by the drive, so must be done in software. This is where the infamous DeCSS code can be used.

4. Stream analysis and splitting

DVD Audio, Video and sub-picture data is all combined on a DVD. This must be split up and passed to the appropriate part of the software which can handle that kind of data. Each block of data has a header which identifies what kind of data it contains.

5. Data decoding

The MPEG data stream is decoded based upon the MPEG 2 video specifications. This consists of a number of stages, some of which have been omitted for clarity.

6. Huffman decoding

To keep the required data rate low, the data is encoded using a Huffman algorithm which represents the most frequently occurring pieces of information (symbols) using fewer bits, and the less frequent ones using longer bit strings. This means the decoder must operate on individual bits rather than whole bytes.

7. Inverse Discrete Cosine Transform (IDCT)

The human eye is less sensitive to the fine detail in an image, particularly if it's changing rapidly, than it is to the larger features. The MPEG algorithm, and the JPEG algorithm upon which it is based, exploit this fact by converting small blocks of image data (8 x 8 pixels) into frequency data and then encoding each of the resulting numbers with a different level of accuracy.

Since the eye is less sensitive to the fine detail, the higher frequencies are encoded using fewer bits.This makes the MPEG algorithm 'lossy', which means that the decoded video is not the same as the original video prior to encoding. However, if performed carefully, the algorithm can achieve a very good approximation to the original while still greatly reducing the data rate.


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Anti-spam
REDNET
Networking & Internet
REDNET Ltd, 6 Cliveden Office Village, Lancaster Road, High Wycombe, Bucks, HP12 3YZ
Tel: 0800 970 5000 E-mail: contactus@red.net

8. Motion compensation

The MPEG algorithm encodes only the parts of each image that have changed, so that when there is very little motion in the image, less information has to be stored or transmitted. The volume of data is further reduced by noticing that a given part of the current image is very similar to another part of an earlier image, and thus need not be stored/transmitted again.

Instead, a vector description of the movement is sent along with a compact description of any changes that should to be applied to the image data when it is copied from the earlier image.The video decoder spends a lot of time copying and slightly altering blocks of image data so this operation has to be performed quickly.

9. Colour space conversion

The displayed images must be in RGB (red, green, blue) format because this is what the graphics card uses, with each pixel colour being represented by 3 numbers, one for each of the RGB components. MPEG and JPEG instead use a different colour space called variously Y Cb Cr or YUV.

Here Y is simply the brightness of the colour, and if displayed on its own gives a black and white version of the image. Cb and Cr together encode the colour information for the pixel, and the advantage of using Y Cb Cr over RGB is that it allows a further reduction in the amount of image data because the eye is less sensitive to colour information than to brightness.

So the amount of Cb and Cr information is reduced by half both vertically and horizontally, leaving only quarter of the data to be encoded for each of the two colour components. Combined with the brightness component the result is a halving of the data rate just from this one change, but it does mean the decoder must convert the decoded image data back into the RGB form for display.

10. Synchronisation

It's important that video data is synchronised with the accompanying audio, otherwise people start talking before or after their lips move on screen, and explosions can be heard before being seen. As small variations in video playback speed are very hard to notice, but the ear quickly picks up small changes in audio playback because of pitch changes or drop outs, it's usual for the video to be synchronised with the audio, and not vice versa.

11. Image overlay

If subtitles are enabled, or an on-screen menu, this image data is merged with the moving video stream

12. Image scaling

The resulting image is scaled to the correct aspect ratio defined for that title (4:3, or 16:9) and then any user-defined scaling is applied (to fit a window, or expanded for full screen mode for example)

13. Screen plotting

The image is then sent over the PCI bus to the PCI graphics card, where the screen memory is held. The RISC OS Sprite plotting routines were not fast enough for our requirements, and didn't make the best use of the available hardware, so we developed some faster routines which make use of a DMA controller engine present in the Intel IOP321 which can "burst transfer" large amounts of data across the PCI bus without involvement of the CPU. This allows us a 9-fold decrease in the time spent by the CPU plotting the image onto the screen.

14. Decoding audio

The encoded audio, whether in AC3 (Dolby Digital) or MPEG Audio (PCM) must be decoded to the individual raw PCM formats. With 5.1 surround sound, there can be six separate audio streams obtained from a single AC3 input stream.

15. Downmixing

For machines which only have a stereo output, you cannot just output the front left and right channels directly, as you would lose all dialog audio which is containing in the front centre channel. As such, the surround mix is downmixed, or combined, to produce a single stereo output, containing all the audio information in the original 5.1 mix.

More advanced downmixing can be used to encode the rear surround channel into the stereo signal also, to allow external decoding by a Pro-Logic compatible decoder which can extract the single surround information from the stereo signal.

16. Output

The resulting PCM audio streams are then sent to the RISC OS sound system for mixing with any other audio inputs such as CD audio, and finally playing through the sound hardware. In the case of a PCI soundcard, several PCM streams can be played to negate the need to have an external surround sound decoder.

All these various stages have to be scheduled and processed very carefully, and very quickly, otherwise audio and video can break up if one part of the process isn't providing data to the next quickly enough. There also needs to be error handling in place, to determine what should be done if a particular block of data cannot be interpreted by any of the decoders, which could arise from a scratched or damaged disc for example.

Other software components handle the user input, playing and pausing the video, and selecting menu entries.

I hope this has given you an insight into the world of DVD on RISC OS and that when we finally get it to the commercial stage you will appreciate just how much work has gone into it.

Links

www.cinodvd.com

www.ecma-international.org

www.iso.ch

www.ansi.org/

www.osta.org/

www.mpegla.com

www.dvdforum.org

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The Iyonix: One Year On

There was a time when we felt that RISC OS was up a blind alley with nowhere to go. The reason was simple: 26-bit code and dependence on custom chips.

With the ARM chip design moving to 32-bit code there was always the possibility that StrongARM chips would cease to be produced and RISC OS couldn't run on 32-bit architecture. Then there was the fact that RISC OS was designed to use the VIDC and MEMC custom chips, again the Acorn market was the only market to use them. Someone, somewhere would pull the plug.

RISCOS Ltd was making valiant efforts with its RISC OS Select scheme but no fundamental changes could be made to the operating system itself.

The move to 32-bit ARM chips was moving ahead and Intel had begun their manufacture basing them on their very own XScale chip architecture previously known as Strongarm 2. Not the fastest clocked chips in the world, 400MHz and 600MHz, but we in the RISC OS market already knew that clock speeds weren't everything, and besides a 600MHz ARM chip was over double the speed of anything we were used to.

Not only that but the Risc PC's physical specifications were getting very dated with bus and disc access speeds in the PC market getting faster and faster. Great machines but even the most elegant designs get superseded.

Then there was the operating system itself. This was owned by Pace, they had bought it to drive their set-top boxes and had employed dozens of ex-Acorn programmers to make the changes so the operating system would run on 32-bit machines and avoid the need for the dedicated chips.

But would we ever see it? The future did not look particularly bright with many broken promises as well as unfulfilled ones.

Until November last year when Castle Technology Ltd announced and demonstrated their exciting new Iyonix PC. With no rumours and no pre-announcements the machine was launched on to the unsuspecting world as a 32-bit machine which used the Intel XScale chip and the Pace version of RISC OS.

The machine itself was launched at the end of November 2002 and people were queuing up to buy it. Through the following year there have been milestones to mark the continuing development and evolution of the Iyonix PC and other Castle-related products. We are going to take a look at those developments as they were announced and also look at what today's Iyonix PC looks like.

Printers

In May Castle announced its new version of the RISC OS Printer Manager: 'pop-up' !Printers. This new printer manager replaced existing versions of !Printers and offered many fixes to long-standing bugs and the following new features:

Connecting a new printer causes !Printers to self-configure the new printer, popping up an active printer icon on the iconbar immediately with no manual setting up required.

If the Printer Manager does not recognise a particular printer, a simple dialogue box appears allowing the user to select an appropriate Printer Definition File from those installed on the computer.

The new !Printers seamlessly supports USB printers. The plug and play features of USB mean that a wide range of USB printers can now be used, even through low cost USB-to-parallel adapters.

Duplicate is a new feature that allows the user to 'clone' multiple configurations for a single physical printer. This makes it easy, for example, to switch between draft and high resolution without having to keep reconfiguring the printer manager.

In support of the technical changes to the printer dumper software the Printer Manager can now send very long control strings to the printer. This is important as many modern low-cost inkjet printers communicate using human readable messages which can be too long for use by !Printers up to at least version 1.64a.

The process of installing a new printer has been greatly simplified by a new shortcut in the iconbar menu. Clicking on the "Install new printer" shortcut brings up the available printer definitions and a simple double-click installs the desired driver.

Faster hard drives

In addition to the pop-up printers the Iyonix PC had a potentially very fast hard disc access, but the promise had not been fulfilled at the time of release. It took a long time coming but also in May came UDMA hard drive access.

Considerable work was undertaken to implement UDMA support within the standard ADFS structure of RISC OS 5.

With UDMA support, hard drive performance is boosted significantly with theoretical read speeds of up to 100MB per second. All functions which involve hard disc activity are now virtually instantaneous, all aspects of the Iyonix PC will benefit from a noticeable increase in performance, from initial booting of the computer, to using a wide range of desktop applications, using the 'C' language compiler, and even when shutting down.

Depending on the hard drive installed, current in-use speeds of up to 45MB/sec can be achieved (speed limited currently by hard drive technology). This is over 22 times faster than a standard Risc PC. So a massive 80MB sprite file will take just under two seconds to load into Paint.

Browser technology

Web browsing has always been a sticking point with RISC OS, as a minority market it has been difficult keeping up with the latest Web developments. Oregano was best web browser to date but it too needed further work.

Oregano 2 was released for all RISC OS machines. It is based on Oregan Networks' multiple platform "TV Interactor" browser, already delivered for products like Sony's Playstation2. As the "TV Interactor" code continues to be developed into the future, the RISC OS community will continue to benefit from this work.

Then there was the display side of things with Iiyama's top-of-the-range LCD display, the AU5311DBK, for the Iyonix PC. This fantastic 20.8" LCD display was the first Iiyama LCD to be able to display

the Iyonix PC's top screen mode of 2048 x 1536 pixels, in 16 million colours.

The LCD display features a 0.207mm pixel pitch with a wide viewing angle of up to 170deg; full on-screen display menus; and two separate monitor inputs. Mind you, at the discounted price of £3179 it wasn't cheap but it was impressive.

SCSI connection

Getting many hardware peripherals attached to the Iyonix required the development of a special SCSI interface package and that's what we got: The universal SCSI filing system to the Iyonix PC that gives the ability for third party companies to create or update drivers for a wide range of SCSI cards (both PCI and podule) without having to write a filing system themselves.

It also opens the way for Iyonix PC users to connect a wide range of new or existing high speed SCSI devices to their system (including devices used with earlier RISC OS systems). SCSI device drivers from a variety of suppliers are already available for the following SCSI devices:

- Epson Scanners
- Mustek Scanners
- Nikon Coolscan2 film scanners
- Hard drives
- CD Rom drives
- Removable media

SCSI through the PCI expansion bus makes best use of the enormous bandwidth and capability of bus mastering over the 64-bit wide bus, while SCSI podule cards can take advantage of the new faster podule slots (backplane required).

Respect to the Penguin

No modern computer platform is complete without its implementation of Linux. Linux for the Iyonix PC is based upon the developments of ARM Linux and XScale support.

Linux for the Iyonix PC is supported by a port of kernel version 2.4.19, although work is already underway to support 2.5, for which changes will be contributed to ARM Linux.

The current version is very much in development, and does not yet support all of the Iyonix PC's hardware.It boots fromhard disk and presents a usable and stable Linux system. As with ARM Linux on previous RISC OS machines, Linux is presently booted from within RISC OS.

Castle provides a pre-built kernel, patches, and bootloader for parties interested in developing or experi-menting with Linux for Iyonix.

Mass storage

With USB being the interface everyone needs to support and mass storage devices becoming more and more common: Castle announced the availability of support for USB storage devices for the Iyonix PC. Using the plug and play features and fast data transfer protocols of USB, Castle added access to the following USB mass data storage devices:

- USB hard drives in native RISC OS "FileCore" format and PC "FAT 16" format
- USB flash devices (keyrings, memory cards, card readers and so on)
- USB digital cameras with mass storage
- USB removable cartridge drives (ZIP and the like)
- USB MP3 players

RISC OS users should ensure that any device conforms to one the following conformant, non-vendor specific, USB mass storage classes (08 06 00, 08 06 01, 08 06 80).

RISC OS

Development of the core operating system was still in question: Pace were in trouble and had dumped their RISC OS development and fired or redeployed most of their ARM programmers.

In July there was the second bombshell of the year (closely followed by the third) when Castle Technology Ltd announced the purchase of the RISC OS from Pace. The transaction involved the payment of an undisclosed cash sum, ongoing technical support for Pace's existing products and the grant of a licence back to Pace for intellectual property rights.

Castle also formed a joint venture with Cambridge based Tematic Ltd to develop, market and support an embedded version of RISC OS to be used in the new generation of smart multimedia products for the high volume consumer electronics market, while Castle continues to service the desktop market.

Oregano changes flavour

In a very unexpected move Castle transferred the sales, marketing and technical support for Oregano 2 to Oregano UK Ltd founded by Richard Brown, a RISC OS dealer based in Southend-on-Sea.

Oregano 2 development continues to be produced by Oregan Networks Ltd, and original copies of Oregano continued to be supported by Castle. The reason for this particular move was given as allowing Castle to focus all of its attention on selling RISC OS to a wider audience.

Iyonix PC Specification

All Iyonix PC models feature the XScale processor running at a breathtaking 600MHz. They have accelerated high resolution graphics of up to 2048 x 1536 pixels in 16 million colours, a high quality UDMA100 hard drive and 200MHz DDR memory. Together with a host of bundled software.

Memory/HD/CDRW	Specifications (Model dependent)
Hard disc drive	40GB; 80GB; 100GB
CD/CDRW	48x read (48x write, 24x rewrite)
Floppy drive	Standard 3.5" supporting ADFS, DOS and Atari from 360K to 1.6MB
Memory	128MB or 512MB 200MHz DDR
CASE	MicroATX midi tower 2 x 5.25" bays 3 x 3.5" bays (1 hidden) 4 x PCI slots 'Soft On' switch on front 'Reset' recessed on front
PSU	Input 180-264 volts 47-63Hz (110 volt available by special order), 250Watt PSU with silent mode

Motherboard features

Size	MicroATX
Processor	ARM® compatible INTEL® XScale™ 80321
Sound	CD quality AC97, 16bit soundblaster standard
Unique ID	MAC address
Video	Resolutions of up to 2048 x 1536 pixels in 16 million colours

Expansion cards

Once upon a time Intelligent Interfaces produced some very interesting expansion cards for the Archimedes and Risc PCs. The only thing stopping them from working on the Iyonix was the fact that their code was 26-bit only but Castle announced that it had been working with Intelligent Interfaces to upgrade their software and bring these excellent cards back into the fold.

With the assistance of Castle, Intelligent Interfaces used the latest Acorn C/C++ Development Suite to produce 26/32 bit neutral versions of the modules for their range of 'legacy' expansion cards (podules) including:

- IEEE488 (GPIB);
- 16 Bit Parallel I/O;
- Dual High Speed Serial;
- Single Width I/O;
- User Port;
- 12 Bit Analogue to Digital Converter.

The 26/32 bit neutral modules are loaded from disc so there is no need to upgrade the expansion card ROM itself. They have the same specifications as the previous 26-bit versions and, therefore, can be used as direct replacements.

Scots Iyonix

Which brings us up-to-date with a little trip to Scotland where Castle and Liquid Silicon will be bringing the Iyonix PC to Scotland on Monday the 8th December in order to show off its capabilities to the many Scottish RISC OS users.

The Iyonix PC will be on show on Monday 8th December from 7.30pm until 10.00pm. Edinburgh Airport is adjacent to the M9, M8, A8 and A90 with easy access from Edinburgh itself, from Glasgow, from Stirling and many other areas.

The evening will start with a presentation of approximately one hour's duration. After this staff from Castle and Liquid Silicon will be on hand to provide further information and answer any questions.

RISC OS 5

The Iyonix PC comes with RISC OS 5 programmed into Flash ROM, meaning that upgrades can be easily made using a simple software update available from the web. Additionally as the Flash ROM can only be programmed by an updated version of the operating system, RISC OS it is not subject to viruses in the same way as disc based operating systems.

RISC OS is a powerful, yet easy and intuitive to use operating system specifically designed to run on ARM® compatible processors. Software applications follow tight guidelines to ensure that software has a familiar feel from application to application.

Help!

Developing the Iyonix PC has meant much more than just slotting together a few new components with a new operating system. Behind the scenes there has been a massive amount of work developing systems and protocols to help turn the Iyonix PC into a computer that can stand up to the modern world.

One of those areas is the application Help facilities. Good help systems make software easy to use and increase user's satisfaction (or at least, reduce their frustration). Other platforms offer sophisticated help systems which make the traditional RISC OS !Help text files look rather basic.
So Castle have proposed improvements to the way help works on the Iyonix PC (and other systems) by making it more accessible and visually appealing, while retaining backwards compatibility.

Developers are encouraged to provide meaningful interactive help messages within their applications. The help should explain the function of a control and not simply explain that clicking on a check box will enable it without explaining what the function does. Messages such as 'Click Select to enable obscure feature X' , or even worse the infamous, 'Click select to not select feature X' .

Applications should provide a !Help file which can be accessed from the Filer and it should also be accessible from the application's iconbar menu. In RISC OS 5 pressing Menu over an application on the pinboard will show a Help menu item to access the !Help file if one exists.

HTML Help

All applications intended for use on the Iyonix PC should be supplied with help in HTML form which has many benefits over plain text:

- Multiple fonts and text sizes can be used to make headings stand out
- Hyperlinks can be used in conten ts pages and indexes and for cross-references
- Help files can reference help files belonging to other applications
- Pictures and diagrams can be included

A large number of RISC OS users are unaware that application Help can be accessed from the application in the Filer window. This is understandable, as most users load applications by double-clicking a particular file or by launching it from the Pinboard, only rarely do users see applications in a Filer window.

To make it more accessible application help should be available as follows:

External ports

- 2 x RS232 Serial ports
- 10/100/1000 base twisted pair networking port
- Audio in socket
- Mic in socket
- Audio out/Headphone socket
- Video
- 4 x USB (2 front, 2 rear)

Internal connectors

- 2 x IDE connectors UDMA100 supporting 2 drives per connector (1 occupied)
- FDD connector (occupied)
- DDR RAM socket (occupied)
- 32-bit EASI podule expansion socket (2 slot backplane required)

PCI Expansion

- 4 x PCI slots total; 2 x 64bit and 2 x 32bit
- Occupied slots are contain:
- x1 nVidia GeForce 2 MX graphics card
- x1 USB 1.1 expansion card USB
- x2 slots are free for customer use

Improvements over Risc PC

- Software runs up to 5 times faster
- 16 million colour support now up to 2048 x 1536 pixels (was 800 x 600 pixels)
- Hard drive speed up to 50 times faster (dependent on drive specifications)
- NEW - PCI expansion system
- USB support built-in
- Gigabit networking built-in
- More space inside for case for expansion (equivalent to two slice Risc PC)
- Much quieter in operation
- RAM access is 25 times faster
- Memory capacity increased to 1GB
- IDE devices supported up from 2 to 4

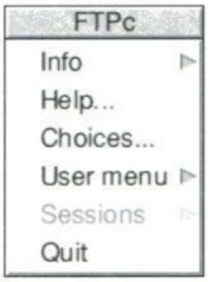
Filer's App - Help menu (as now)

On the application's iconbar menu Help should be the second item, below Info

On the application's main menu Help should be last item in main menu

F1 key (on the Iyonix PC this will be labelled Help as well as F1)

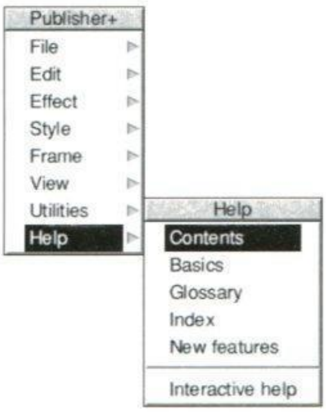
Each of these options should open the application's help at the first page, unless something in the active document was selected, in which case it may offer context sensitive help, if available.



The position of these menu items has been carefully chosen. Iconbar menus always open with the pointer at the bottom of the menu with Info at the top and Quit at the bottom. By making Help the second item, it is quite obvious; it is well away from Quit so it is unlikely that Quit will be clicked by mistake and no extra mouse movements will be required to access existing menu items (other than Info which is rarely used).

Several applications already provide Help below Info on the iconbar menu, including Marcel and the new versions of FTPc, PDF, Caller Display and Teletext+.

Similarly, Help should be available as the last item on the application menu. These menus open with the pointer at the first item and the most common items near the top of the menu. By making Help the last item in this menu means that users will not find any current items displaced. Users should soon learn where to look for Help if it is always the last item on the menu.



Some applications including Impression Style and Publisher already provide Help as the last item on the main menu. It was felt that Help is important enough to justify it's inclusion on the main menu rather than a sub-menu where it may not be found.

Where multiple help pages are available the application may provide a Help sub-menu, allowing the user to pick a particular topic from the Help menu item, but clicking on the Help item without opening its sub-menu should always open the main help file.

Some older systems may not have a web browser available, so it is recommended that applications provide help in plain text format as well as in HTML format.

The application's !Help file can be set up to open the HTML file where an HTML browser is available, and fall back to plain text format where there is no browser. This is achieved by making !Help an obey file with the following contents:

```
Set AppName$Dir <obey$dir>

Set AppName$Help
<obey$dir>.Documents.index/html

if "<alias$@RunType_FAF>" <> ""
then filer_run
<appName$dir>.Documents.index/html
else filer_run
<appName$dir>.Documents.index/txt
```

The help menu items and F1 key should use the same mechanism to open the help text and this is best achieved by making these execute the !Help file: Filer_Run <MyApp$dir>.!Help

Application System Variables

Applications should set the following system variables as appropriate:

AppName$Help Full pathname to HTML help file

AppName$Version Application's version number

AppName$Web URL for application's home page on the World Wide Web

AppName$Title Application's full title

AppName$Publisher Application's publisher

AppName$Description Concise description of the application

AppName$Running Set to Yes when the application is running (as defined in RISC OS 3 PRM page 4-497)

These variables should be set in the !Boot and !Run files and may be used to provide cross-references from other documents and also for a global help system which lists all help available on the machine. It may also be used by a search system which can search and index all of the available help.

Cross references can be achieved as shown in the following HTML fragment:

```
You can upload files to the web
server using the <a
href="file:/<FTPc$Help>">FTPc
application</a>
```

This method of linking can be used in Browse, Fresco and Oregano for example.

Directory and filenames

It is recommended that help files are located within a Documents directory within the application directory. The HTML help file should be given the name index/html and a plain text version should be called index/txt. A side-effect of this naming strategy is that the documentation files can be viewed on a PC or other system, and this may be useful if the user is having difficulties installing the software. The application directory structure should then look like this:

```
!Application
!Boot
!Help
!Run
!RunImage
!Sprites
!Sprites22
Documents
  index/html
  index/txt
```

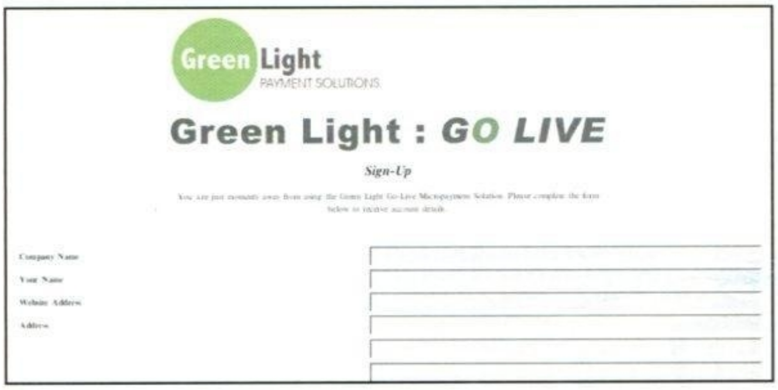
Just one example of how Castle Technology is trying to make your RISC OS experience even easier.

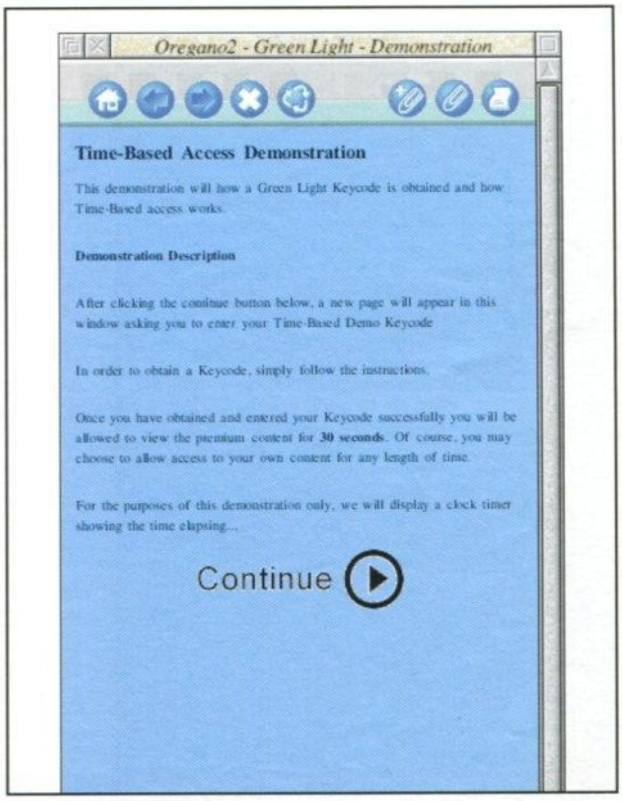


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Getting paid by phone







We have looked at various different sorts of e-commerce of the past few issues but getting paid is the hard bit. Either you use someone else's payment system which can be awkward (and there are pitfalls including having to make a certain amount per month otherwise you don't get anything).

Or you have to get a online payment certificate and be able to take credit cards on your own. This is long-winded and involves a lot of work. Plus the Bank you work through may keep your money for weeks in order to cope with potential Internet fraud.

However there is one method of payment we haven't yet looked at which has a lot of benefits in terms of ease of use. It is quick and easy to set-up you can have it up and running within 24 hours whether you are a business or an individual and it is tailormade for the Internet.

It's mobile phones.

I kid you not. You might have done it already, if you want to get a new ringtone you look over someone's list which might be on the 'Net or in a magazine. You dial the number and you get the ringtone, and the cost is charged to your phone bill. Easy. That's pretty much what we have here, but for products other than ringtones.

Green Light is a payment solution that enables your customers to make small payments via their mobile or fixed line telephone, by either dialling a premium rate telephone number or sending an SMS. They then receive a unique "Keycode" which will allow them to access content or services on your Web site, and you earn revenue from the cost of the call.

You decide what you wish to charge for and how much to charge, and Green Light facilitates the secure online payments.

The system integrates seamlessly with your Web site. Keycode generation, authentication and Web site entry management are all included in this solution.

On arriving at the access point for your content or service, the customer is prompted to obtain a "Key Code" by either dialling a premium rate telephone number or sending an SMS.

If they call the premium rate number, they will hear a 10 digit code read out to them, and if they send an SMS they get a reply containing the code. Once the customer has obtained their 10 digit Key Code, they can then enter it into the validation box on your Web site.

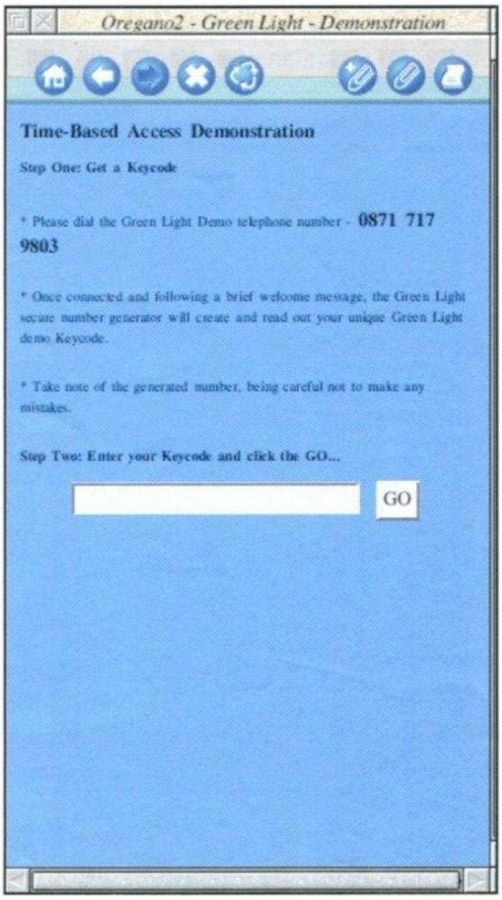
At this point the Green Light Validation server verifies the Key Code via a secure connection to your Web site.

If a successful verification is made, Green Light enables your customer to access the content for the specified length of time, or download their selected item.

If the Key Code is invalid, the customer will be prompted to try again as a mistake may have been made during input. If the Key Code has expired, your customer will be prompted to obtain a new Key Code as described above.

And that's pretty much all there is to it, obviously you have to integrate it into your website but that is made as simple as possible.

Now as we are using a person's mobile phone or landline there are limits on how much you can charge, the GoLive option (which is the sign-up and start version) works up to £3.00 per transaction.







The options are interesting, obviously if you are selling software you might just want to allow a person just one download, but maybe not, perhaps your service allows access for a given period of time rather than a one-off product? In that case you can set the options to allow the Key Code to be valid for a period of time, a day, a week, a month whatever you want. Or a fixed number of uses from one up.

All Key Codes will automatically expire 60 days after first issue if unused. Once used for the first time, Keycodes will last for as long as you have specified.

Obviously this service isn't provided for free so there is a charge, and this is how much you get for each transaction:

Keycode Cost	Your Outpayment
0.75	£0.62
1.00	£0.82
1.50	£1.23
2.00	£1.65
2.50	£2.06
3.00	£2.47

Rates are rounded to the nearest penny and inclusive of VAT, which will be deducted prior to payment. There is also a fee if the number of actual value of accesses is below a certain limit so, for example, you should take off about another 55p from the figures above if you're not going to be pulling in more than a few thousand pounds per month.

There are essentially two services that you can go for: Green Light Go-Live is an excellent service that you can sign-up to online and start using immediately. There are no set-up or maintenance fees, and this straightforward package gets you immediate pay-outs and no hassle.

You only actually get paid when the amount of money generated goes above £50, but unlike some e-commerce companies, you don't lose the money it gets carried across until you've made the £50.

Premium service

Green Light Premier is a bespoke solution that can be tailored to your requirements. Becoming a Premier customer requires additional upfront payments but Green Light will actually work with you to create a service that matches the business you're in and technical requirements of your Web site.

In addition you can negotiate your rates, you can change the call number and use one with different call rates and also do some branding of the actual Green Light access pages. Branding also includes the recorded message that is spoken when the customer calls the premium rate number, the actual cost of branding the recorded message depends on things like the length of the message required and the source of the recording.

Future

Obviously we are most interested in the fast set-up options but Green Light have a whole set of developments they are looking to introduce which includes SMS integration, advertising engines and enhanced network level statistics.

Steve Turnbull
steve.turnbull@acornuser.com

Where are you now?

After our discovery of the Geocaching game in the last issue we happened to be listening to the BBC Radio 4 programme Excess Baggage hosted by Sandie Toksvig. One of her guests was someone who has been taking part in a different activity with GPS systems: The Degree of Confluence Project. The following information is taken from the Project Web site (**www.confluence.org**) with permission:

Alex Jarrett started the project in February 1996 because he liked the idea of visiting a location represented by a round number such as 43 degrees N 72 degrees W. What would be there? Would other people have recognised this as a unique spot? Another reason was that a friend managed to convince him to buy a GPS and he had to come up with something to do with it. He also hoped to encourage people to get outside, tromp around in places they normally would never go, and take pictures of it.

He visited several confluences of his own and posted them to his personal web site. Before long others found the site and visited confluences of their own, and it just snowballed from there.

The Degree of Confluence Project began as a hobby and grew into a global effort. To participate, you find the spot where lines of latitude and longitude intersect in whole numbers (integers), take photos, write a report about the adventure, and send everything to the project web site. There are still more than 11,500 confluences to be visited and documented.

The Web site can be used to show students the reality behind latitude and longitude: visit locations by country, choose a confluence, and view the photos. The pictures, along with a narrative describing the adventures it took to get there are then posted on the project Web site. This creates an organized sampling of the world.

Another goal is to document the changes at these locations over time. Although the project initially wants to visit as many different locations as possible, they also want people to revisit a confluence if you're in the area.

Confluences in the oceans and some near the poles have been dropped but there are still 13,537 to be found. You're invited to help. There is a confluence within 49 miles (79 km) of you if you are on the surface of Earth.

You can take a look at the visits at **www.confluence.org**

So why go confluence hunting? There probably are as many different answers to this question as there are confluence hunters, but here are a few reasons:

Tim Vasquez: "Confluences are interesting to me because they represent randomness that emerges from strict order. It goes far beyond a silly quest for invisible man-made boundaries. The confluence latticework is an open defiance of the order our culture imposes on us, which frowns on tourists who abandon the travelled roads, the sanitized vistas, and the stops designed to conjure up dollars for empty memories.

"Confluences are in curious places that embrace you in their history, character, and ecology, surrounded by people who are locals in every sense of the word. You simply haven't experienced a region unless you've tried seeking out its confluences."

Luis Felipe Trigo Boix: "One thing that I like a lot about confluence hunting is that this is a place that you have never seen (and many times will never see again), that you know exactly where it is, you do not know how to get there but will find a way and, no matter how it turns out to be you will be so glad and satisfied to have been there !"

Dave Patton: "For me, it combines a variety of interests, such as the outdoors, hiking, and photography. Confluence hunting is like a grown-up easter-egg hunt, there may only be one 'treasure' to find and, at least in theory, you 'know where it's hidden', but the difference is that you don't really have a choice of where to look, but you certainly do have a choice as to how to look, and the 'thrill of the hunt' is still there, just in a different way.

"Certainly when one sees the distance to a confluence 'counting down' on the GPS the excitement level rises, but even when you're 'at the spot', there is often that final little bit of 'hunting' while doing the 'confluence dance' to try for 'all zeros'."

There are 64,442 latitude and longitude degree intersections in the world (counting each pole as one intersection). After discounting many confluences near the poles, and in the oceans, 16,146 meet the goals of the project, with most of these (14,027) being on land. There are still 13,537 to be found.

Initially, the information in the database about confluences was entered both manually, and by extracting data from various sources. Since then, there have been various updates, both manual and automated, and when someone finds an error and a correction is made.

Some confluences have been added or changed, where they were in the oceans but a mathematical model shows that they should have a view of land. The altitude listed for a confluence usually comes from a digital elevation model, and may not be accurate.

All of the 64,442 possible confluences have been assigned to one of three categories: Land (21,541), Water (38,411), or Ice Cap (4,490). Confluences that are on 'Land' are those that our data shows as being located on a continent or an island. The presence of ice doesn't change that. A confluence on a lake doesn't change it's status if the lake freezes over in the winter. A confluence located on a glacier is considered to be on land. Confluences not on 'Land' are on 'Water', except for areas with permanent ice, which are categorized as 'Ice Cap', such as confluences near the North Pole.

A confluence is primary if:

1. It meets the criteria outlined in the Poles Problem section.

2. It is on land, or if on a body of water or on an ice cap, within sight of land, so that on a clear day discernible land features can be recognized.

All other confluences are defined as secondary. They will be accepted if visited but are not part of the primary goals of the project. Note that any visited confluence, regardless of whether it is primary or secondary, will be added to the site, even if it is not currently indexed in our database.

There are 40,013 confluences that are not "indexed" in our database, because they lie in the oceans, are presumed not to have a view of land (are more than five kilometers from land), and are unlikely to be visited. An unindexed confluence is presumed to be Secondary, and will be added to our database if visited.

A Primary confluence would be changed to Secondary if a visit shows that there is no view of land on a clear day. This would include a visit to a confluence on a large lake. A confluence that is Secondary because it is "on the water" and is presumed to have no view of land would be changed to Primary if a visit shows a view of land, but only if it qualifies based on the Poles Problem logic.

Poles Problem

If the Earth were a perfect sphere, the north-south distance between adjacent pairs of degrees of latitude (parallels; lines that run east-west) would be the same from the equator to the poles. However, the east-west distance between adjacent pairs of degrees of longitude (meridians; lines that run north-south) varies depending on the latitude, with the maximum distance being at the equator, and the minimum distance being at the poles, where the lines of longitude meet.

Because of the closeness of the degrees of longitude lines towards the poles, we designed a scheme that deals with this skewing of the collection of degree confluences towards the poles. The scheme designates every degree confluence as either Primary or Secondary. While Secondary confluences will be accepted if visited, they are not part of the primary goals of the Degree Confluence Project.

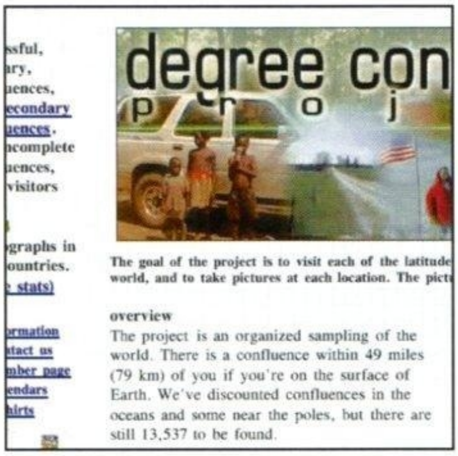
Starting at the equator, all degree confluences are designated as Primary, until the distance between degrees of longitude drops below 2/3 of the distance at the equator. At that point, two thirds of the confluences will be designated as Primary, so every third confluence will be designated as Secondary. This begins at 49 degrees.
111.32km (69.17mi) * 2/3 = 74.21km (46.11mi)

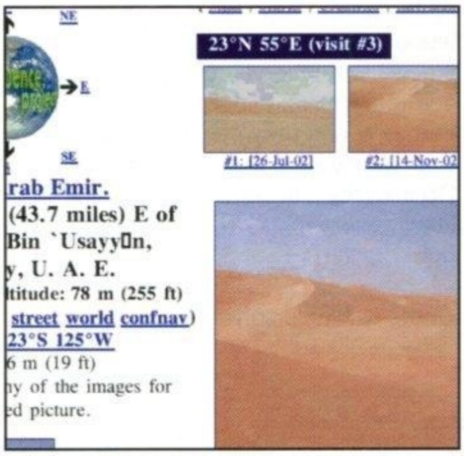
The next change occurs when the distance between degrees of longitude drops below 2/3 of 2/3 of the distance at the equator. At that point, half the confluences will be designated as Primary. This begins at 64 degrees.
111.32km (69.17mi) * 2/3 * 2/3 = 49.48km (30.69mi)

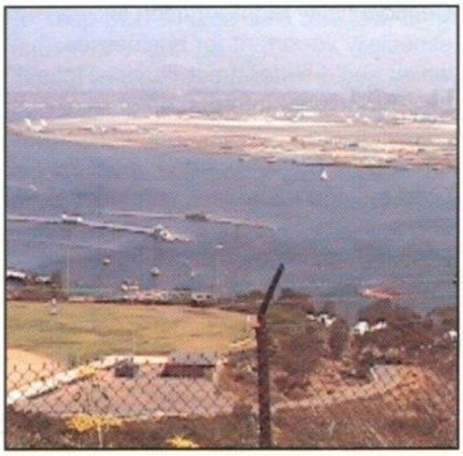
This scheme continues, using the "2/3 rule", until at 89 degrees, only ten of the possible 360 confluences will be considered as Primary, and at 90 degrees, there is only one confluence, and it is a Primary.

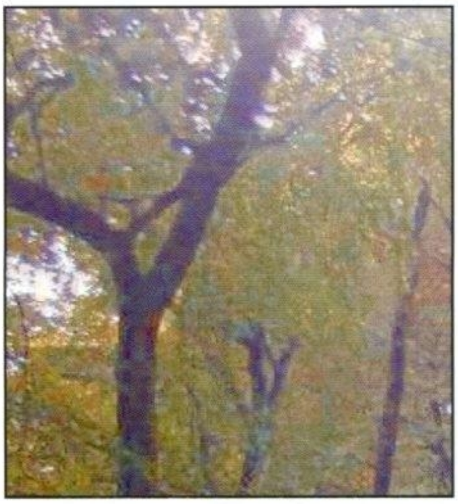
Degree Confluence Project
PO Box 415
Northampton
MA 01061-0415
USA

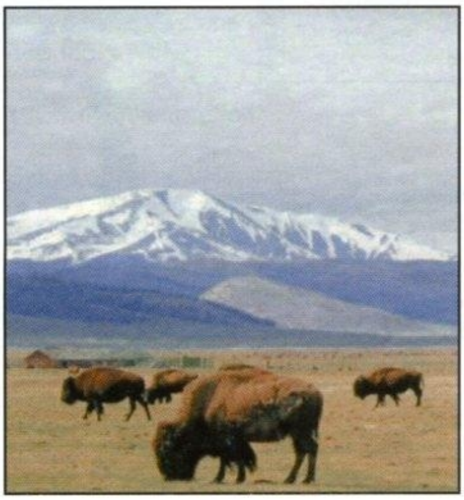
Rob Donaldson
editor@acornuser.com













Protecting your confidential data

Thanks to fast modern computers, cryptography with a 'military' level of security, which is to say unbreakable in practice by all known methods, is now available to everyone. Computer files can be encrypted by means of a cipher – a set of mathematical operations that transforms an original file (known as the plaintext) into an unintelligible ciphertext file or vice versa. The plaintext need not be an ordinary textual message. It can equally well be any type of information that can be represented in a computer file, such as an archive, an image or a sound file.

Why use cryptography?

Many people who own computers use them to store personal or confidential data which they want to protect from prying eyes. Examples of such data are financial records, address books, private diaries, sensitive correspondence, and lists of passwords for online services on the Internet.

Confidentiality of information is especially important for businesses, which could suffer great financial loss if their proprietary information or business plans fell into the wrong hands. Trade unions and political campaigners also need to keep their plans confidential.

Even if there is no possibility of access by any unauthorised person, consider what could happen if a computer unexpectedly needs to be sent away for repairs. The owner may not be able to access the data contained in it because of some fault, but the data might be recoverable and readable by others before the computer is returned. The risk is even greater if a computer is ever stolen.

In the UK, and no doubt in other countries too, any person or organisation that maintains personal information on individuals in computer records is required by law to ensure the security of those records. Strong encryption is the ideal way to do this.

Encryption for RISC OS

Some of the world's strongest known ciphers have been implemented in software for all major computer systems, including RISC OS. In this article I shall give a survey of RISC OS software that can be used to protect confidential data by means of strong ciphers.

All the programs mentioned in this article use only encryption methods which have a good reputation among professional cryptographers. All these programs are freeware, and they can all be found from links on my Web site devoted to RISC OS security and privacy software at **http://web.bham.ac.uk/N.M.Queen/pgp/acorn.html**

Of the available software, *Encrypt* by Stephen Sloan is probably the easiest program to use, and I shall describe it in the greatest detail. This program can encrypt or decrypt files or even whole directories in one simple operation.

A file can be encrypted by dragging it into the program's main window. You are then asked to enter a passphrase with which to encrypt the file. Passphrases of up to 240 characters are allowed. The passphrase must be entered twice to ensure that what was typed by the user is actually what was intended. If the two entries agree, an output ciphertext file can be saved by dragging a file icon to any chosen directory, with a different filename if desired. Alternatively, by clicking on 'Process', the original plaintext file is replaced by the ciphertext file. It's as simple as that.

The procedure for decryption is similar. The ciphertext file is dragged into the program's main window, and the user is asked to enter the passphrase. If the passphrase is correct, the plaintext file is created and replaces the ciphertext file.

For additional security, there is an option to overwrite the original plaintext file after it is encrypted. This is achieved by making use of a powerful utility *Nuke* by Sergio Monesi, which is included in the program. When a file is 'deleted' by RISC OS, only its entry in the directory structure is actually deleted, but all the data remains on the disc surface and can easily be recovered by means of a disc editor or an 'undelete' utility. *Nuke* prevents such data recovery by overwriting the data on the appropriate disc sectors a number of times.

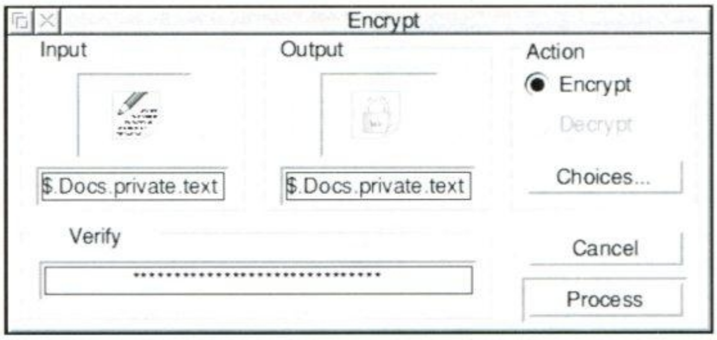
Encryption of entire directories works in a similar way. It is only



necessary to drag the plaintext directory into the *Encrypt* window. Each individual file in the directory is then encrypted, while retaining its original filename.

An additional option makes it possible to zip an entire directory into a single archive file before the encryption takes place. This operation takes a little longer in practice, but it has the advantage of hiding the individual filenames and the directory structure, since the resultant ciphertext is just a single file. Moreover, because of the compression in the zip file, the ciphertext file is usually smaller than the total size of the original plaintext directory.

The zipping operation before encryption and the unzipping after decryption are achieved by means of the modules zip and unzip from the info-ZIP group, which



are included as part of the software. However, to ensure that these operations work in the program, the user must place copies of those modules in the appropriate Library directory of the computer.

Finally, it should be mentioned that *Encrypt* offers the option of selecting either of two alternative encryption methods: the Blowfish cipher (created by the eminent cryptographer Bruce Schneier and ported to RISC OS by Gareth McCaughan) or an early version of the well known program PGP (created by Phil Zimmermann and also ported to RISC OS by Gareth McCaughan).

The second option only works if PGP is already installed in the computer. However, this option does not actually make use of the full power of PGP (public-key cryptography). It uses only PGP's 'conventional encryption' by means of the IDEA cipher. Public-key cryptography is used for secure e-mail and is unnecessary for protecting one's own confidential data.

There is probably no advantage in selecting the PGP option instead of the default Blowfish option. First of all, the use of PGP is slower. Secondly, contrary to the impression one might gain from the old *Encrypt* documentation, the Blowfish cipher is now considered stronger than the IDEA cipher. In technical jargon, the IDEA cipher consists of eight successive 'rounds', of which four are effectively broken by modern cryptanalysis. In contrast, no effective cryptanalytic attacks against Blowfish are known. Despite this difference, both ciphers remain unbreakable in practice at the present time. The point is that IDEA is more likely to be broken at some future time.

An alternative to *Encrypt* is my program *Q-Lock*, which does almost exactly the same thing, but with a very different type of front end and with a few extra features.

Q-Lock uses the IDEA cipher without the need for PGP. Like *Encrypt*, it can be used to encrypt any number of directories, each with its own passphrase. Zipping is not an option, as in *Encrypt*, but it's carried out automatically. The plaintext is also 'nuked' automatically, and this can be done with a higher level of security than in *Encrypt*. Whenever any directory is encrypted, the program also automatically stores a backup copy of the ciphertext file as a precaution against possible loss - if a ciphertext file were to be corrupted for any reason, there would be no possibility of recovering any of the files contained within the original plaintext directory.

Q-Lock also contains an inner application *Nuke-it* which can be used for permanently destroying sensitive data contained in any other directory on the disc. To do this, the user must move the data to a special directory called 'scrap' and then run *Nuke-it*. The data is then 'nuked' with a 'military' level of security (overwritten many times) and can no longer be recovered.

For users of the ANT Internet Suite, *Q-Lock* has a sister application called *Mail-Lock* which can be used to encrypt or decrypt any specified mail folders. These two applications work in basically the same way, and they have the same look and feel.

For additional security of sensitive data, encryption can be combined with steganography, which refers to any method of hiding the existence of data. An application which does this is *Stealth*, which makes use of the strong Blowfish cipher.

Like the applications discussed above, *Stealth* can encrypt a number of directories, each with its own passphrase. But unlike the other applications, it hides all the resulting ciphertext files inside a single 'container file'. A particular ciphertext file can be extracted and decrypted only by entering the correct passphrase. Without a knowledge of the passphrases, no unauthorised person can determine how many encrypted directories are hidden, or even whether there are any at all, by analysing the container file.

Whether or not any encrypted directories are stored inside the container file, that file looks as if it's filled with random data. The reason is that the container file is initially filled with highly random data, and the data in any ciphertext file that is placed inside it looks equally random. This is a general characteristic of strong ciphers - the ciphertext which they produce is indistinguishable in practice from random data. Even sophisticated statistical analysis can't tell the difference.

Finally, the bad news: None of the applications described above will work properly on the Iyonix - at least not yet. The reason is that they all contain modules by other authors which have not yet been made 32-bit compatible. However, it is hoped that those modules will be upgraded in the near future, so that the applications containing them will then work on all modern RISC OS computers.

In the final article in this series I shall describe the RISC OS versions of PGP and GnuPG, the standard programs for secure e-mail over the internet.

Nat Queen
n.m.queen@birmingham.ac.uk

Behind the camera

I admit I hadn't intended to do any sort of camera review in this issue, but we had a digital camera in the office I needed it to do one of the articles in this and another magazine.

So I brought it home and thought, I'll see what happens if I plug it in to the Iyonix. So I did and up it popped on the iconbar. I was still cynical, I've been here before, but when I clicked on the icon there was a short pause and up came the Filer window and there were the images.

It worked out of the box: So the camera we have here is the Minolta DiMage Z1. A very stylish unit which owes a lot to the film-camera heritage of the company but isn't constrained by it.

It's compact, as you'd expect, and not too heavy. But heavy enough, I don't like a camera that feels like nothing. There is a nice clear on/off switch just under the LCD panel at the back and three "on" settings: one for viewing the current pictures (although there is also a quickview option for reviewing and deleting quickly); the standard camera position where you use the LCD for viewing; and finally the "viewfinder" option which physically obscure the LCD and allows you to use the lens viewfinder like a standard SLR camera.

I must admit I was lost on the flash for a bit, until I remembered that it is made available by lifting the top section. The flash options are listed in the table below.

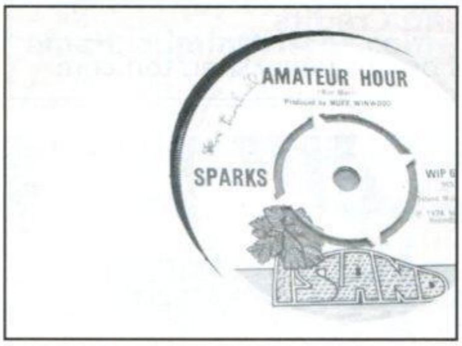
The telephoto is a 10x analogue and a 4x digital which I find a relief. Only the analogue is really worth anything when it comes to taking pictures and cameras with stupid digital zoom values are simply being hyped up.

I'm not going to spend paragraphs talking about all the fancy features this unit packs in because for me the key things are: Ease of use; quality of image; and whether I can get the images out.

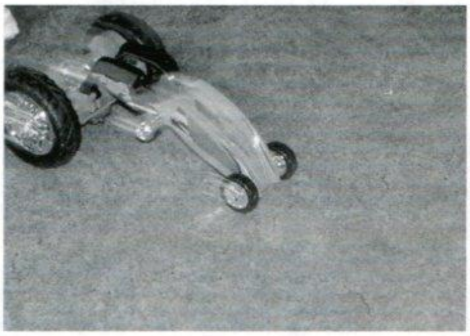
For ease of use the DiMage Z1 is excellent, you can have it on its default settings and in use instantly. The quality of the image is fine, it uses JPEG for its internal file format like most other cameras. You can just plug it in to your USB port on the Iyonix (and if it works on the Iyonix it should work fine on the Simtec USB board) and unload the images. The only thing to remember is to dismount the camera before unplugging it or you run into the "Ambiguous drive name" error.

Beyond that, what else do you need to know? I definitely recommend it, order it now from your Acorn specialist.

Steve Turnbull
steve.turnbull@acornuser.com







Specifications

Number of effective pixels Approx. 3.2 million

CCD 1/2.7-type interline primary-color CCD with a total of approx. 3.3 million pixels

Recording media SD (Secure Digital) Memory Card / MultiMediaCard

File format JPEG, Motion JPEG (MOV) with Audio, DCF1.0, DPOF (Ver.1.1), Exif 2.2

No. of recorded pixels 2048 x 1536, 1600 x 1200, 1280 x 960, 640 x 480

Image file size (approx. at 2048 x 1536) Economy: 430 KB, Standard: 720 KB, Fine: 1.1 MB, Movie (320 x 240, at 15 fps): 340 KB/s

Storage capacity Economy: 32, Standard: 17, Fine: 9, Movie recording (15 fps): (320 x 240) 41 seconds

Flash mode Autoflash & Autoflash with red-eye reduction, Fill-flash, Slow shutter sync. (in Auto/P/DSPS mode), Fill-flash, Fill-flash with red-eye reduction, Slow shutter sync. (in A/S/M mode).Flash cancel possible by pushing the built-in flash unit downward

Flash GN(ISO 100 equivalent) 12.0 (m) / 39 (feet)

Self-timer delay Approx. 10 seconds

Color mode Vivid, Natural, Monochrome, Sepia

Printing output control Exif Print, PRINT Image Matching II, USB DIRECT-PRINT, PictBridge

PC interface Full-Speed USB: 12Mbps data transfer with a USB2.0 compatible computer, Video output NTSC/PAL (selected on the camera)

Battery Four AA Ni-MH batteries, AA Alkaline batteries,

External power source 6V DC (with specified AC adapter)

Dimensions (WxHxD) Approx. 109.5 x 77.5 x 80.0 mm

Weight Approx. 305 g (without batteries and recording media)

Standard Accessories Battery (four AA Alkaline batteries), Neck Strap (NS-DG5000), AV Cable (AVC-200), USB Cable (USB-500), SD Memory Card (16 MB), Lens Cap (LF-242), Shoe Cap (SC-1000)

BETT 2004

7th to 10th January
www.bettshow.com
21 years old
More than 500 exhibitors

Yes, it's that time of year again, and here are some of the brightest and best to inspire your teaching ...

If you thought 3D images were out of your league, think again. Stand SW69 is home to IT3D who have Stereo-Photo on display. This creates 3D photographs from any two images taken side by side. It comes with A4 worksheets and 3D glasses as well as a range of sample photographs ready for processing. Very usefully, there are tutorials to help students with their creations.

Priced at £40 additional figures can be inserted into the scenes and you can convert conventional 2D photos to 3D or pupils can create their own 3D drawings and designs from scratch. A nice touch is that the company have produced two resource packs of 3D images one for Warwick Castle and the other for Historic London with timelines and location maps to help you along. For more information ring 01234 708432.

Clever resources

Pop over to Stand PZ25 and Crown House Publishing (01267 211345) to see Card It! Quite simply this breaks up and randomly sorts content onto cards which can then be used in innovate games. You can use any topic from literacy to Science to Modern Languages.

If you're looking for Modern Language resources, Softease (01335 343421) have new Language Packs for French and German. Designed to work with Textease 2000, Studio and Studio Plus children can create documents, spell check and have their text spoken to them in their chosen language. The spell checker and auto-accent options intelligently make suggestions or put the right accent in for you! Stand C56 is also home to Softease's new ICT resources for Key Stage 1 and 2!

With the focus on past years on core subjects, primary teachers have found that software for foundation subjects has lost ground. Sherston Software (01666 843200) however, have taken their award winning ArcVenture, it won best Primary Software in 1994 and have re-written and re-launched ArcVenture: The Romans. The adventure starts in an archaeological dig where all sorts of finds are waiting to be discovered. However, when an unknown object is excavated they are transported back in time to find out just what it was. All waiting for you on Stand E60.

Espresso on Stand B82 will be demonstrating their new content with resource banks on Buddhism, Judaism and Christianity. There is also a module to assist pupils in the building the research skills to learn about the past focussing on the Romans with on an archaeological dig and Roman re-enactment in York. In addition, look out for new resources in Using the News, French and Citizenship. They also have two new tools. The first is a Presentation Tool.

Using material taken from Espresso's massive archive of video, news articles and images you can create attention-grabbing presentations. There are different levels of use so that even less confident ICT users can produce stunning results. The second tool is a Text Reader which is used simply by hovering your mouse over any Espresso text it will be read out to you.

Free history resources can be found on Stand S19 and at **http://learningcurve.pro.gov.uk** Here are exhibitions, lesson sized activities and interactive investigations all based on interesting original sources from the National Archive's 1000 year old collections. New content is a new Empire exhibition by Ben Walsh and you can pick up your free copes of the updated Teacher's Booklet on how to get the best out of the Learning Curve and ICT in History.

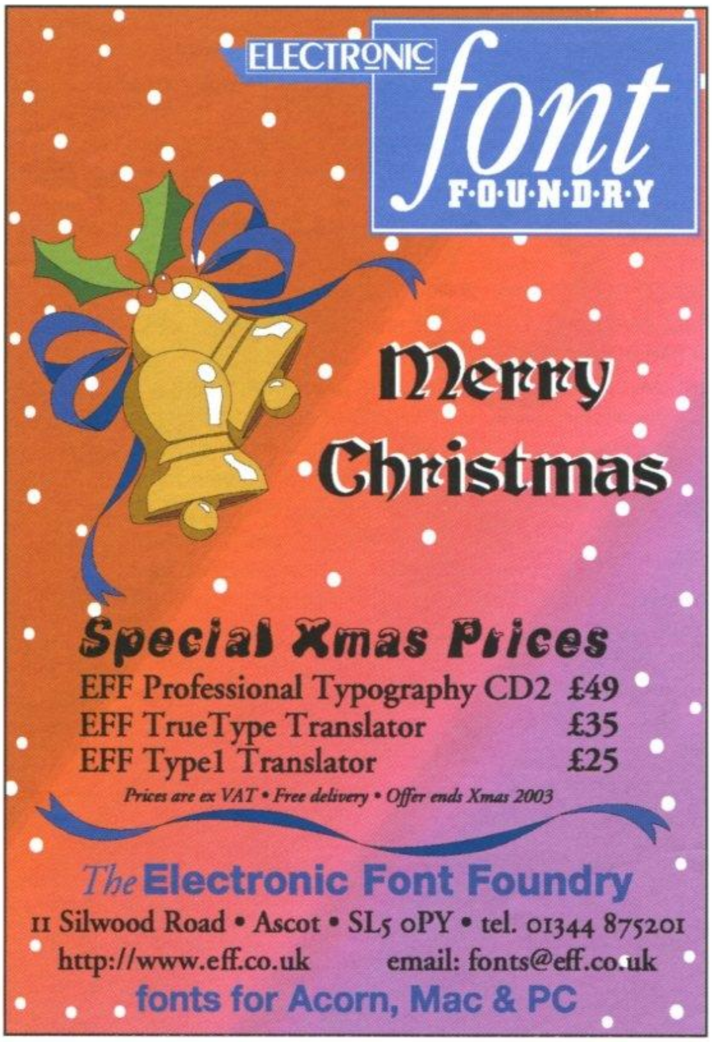
Digital Worlds is a new innovative cross-curricular Geographical Information System (GIS) teaching tool for Primary, Secondary and further education. Digital Worlds GIS combines simple but powerful geographical tools with up-to-date local data and a number of supporting teaching materials. Each school is provided with personalised data, specific to their local area including the new Census 2001, historical maps, current digital Ordnance Survey maps and high quality aerial photographs.

In addition, there are datasets on sites of special interest, relevant to key topic areas across the curriculum are also available. The software has been tailored to each learning stage offering cross-phase continuity. The software for primaries has simplified functions and a child-friendly design while secondary and further education software provides more powerful tools to explore the data and subject area in greater depth. Find out more at **www.digitalworlds.co.uk** or ring 01303 297007.

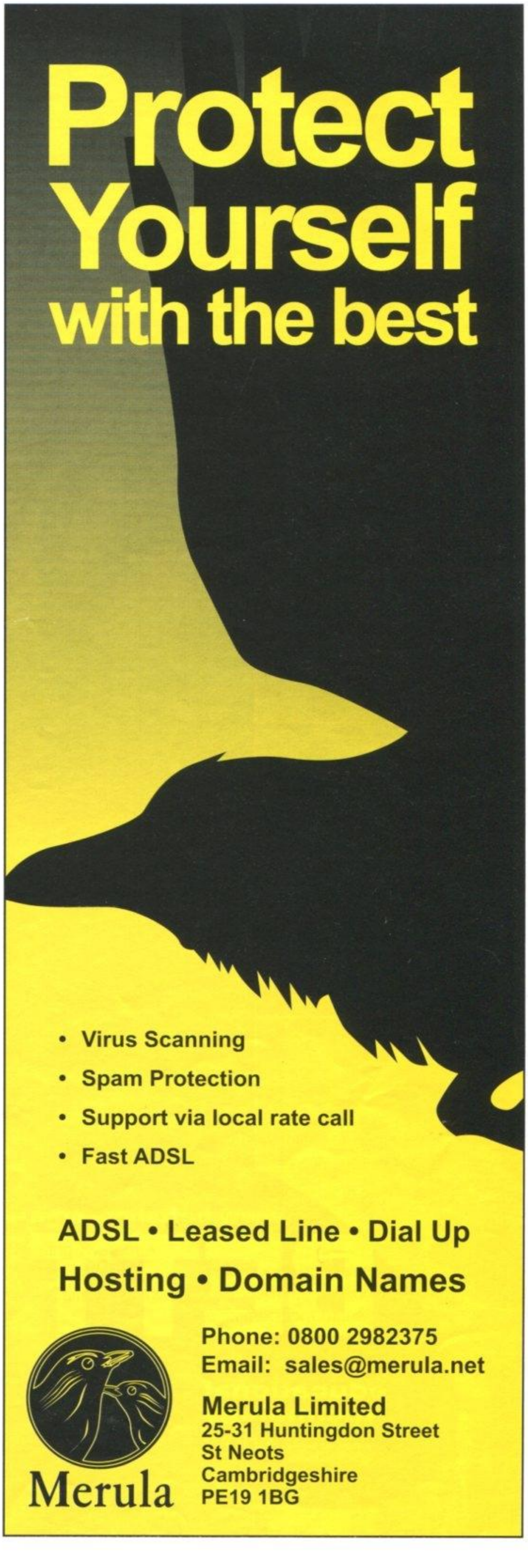
Virtual Image (0161 480 1915) has a series of CD-ROMs to be used as lesson starters. The Literacy Lesson Starters are designed for use with an Interactive Whiteboard or data projector to provide daily warm-up activities for word, sentence and text level objectives. Stand SW91 have also released a range of Science, History and Geography CD-ROMs for Key Stage 2. There are teacher's notes, key facts, multiple choice tests, a labelling activity and an ordering activity. There is also a worksheet wizard which allows teacher to create their very own multiple choice tests. Also look out for their Maths and Numeracy Starters for Key Stage 2 and 3.

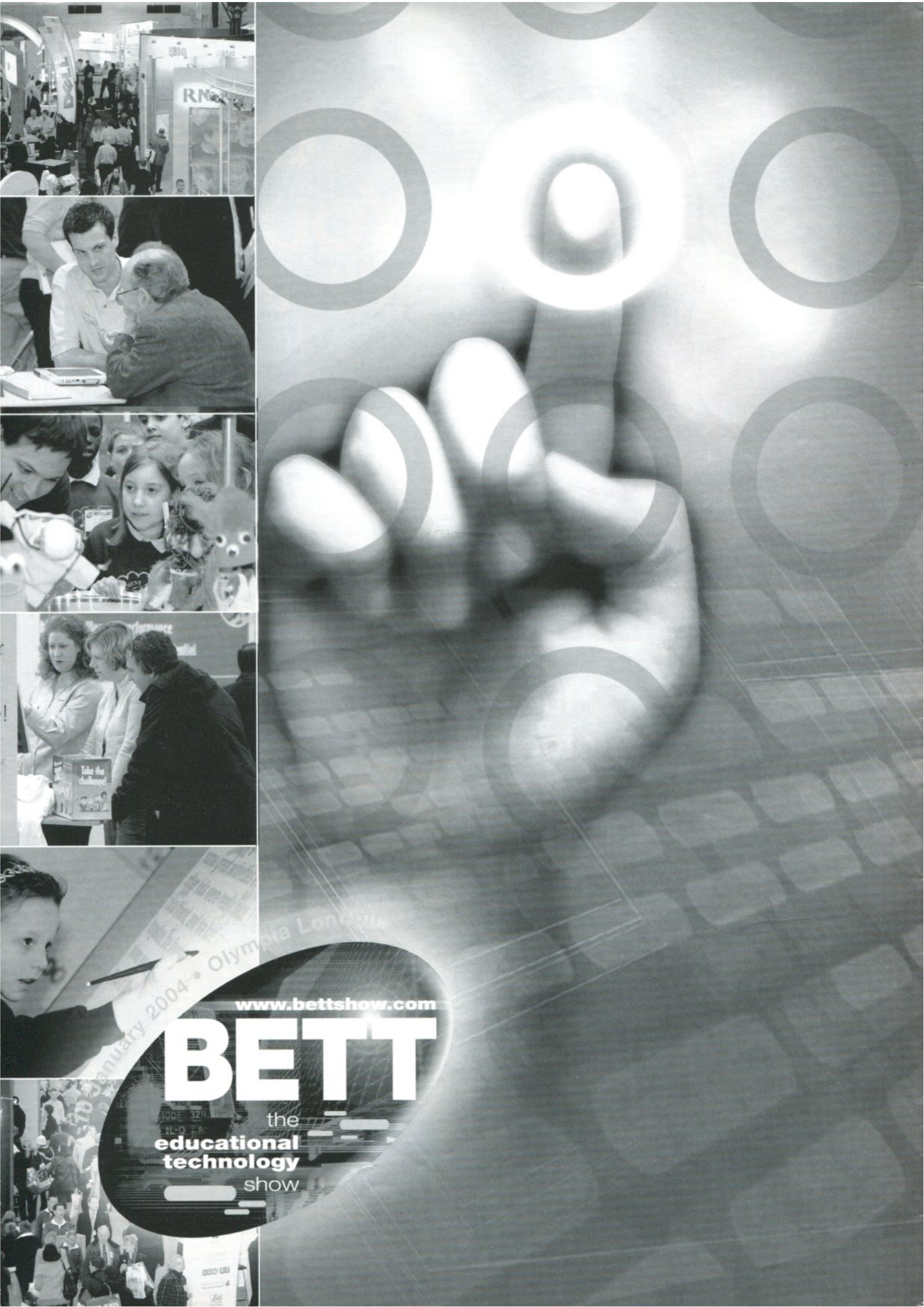
SMILE Mathematics (0207 598 4841) have developed a set of 15 short programs to develop pupils understanding of geometric concepts called Exploring Geometry. Designed to be used on an interactive whiteboard the activities can be used as lesson starters, main activities, or plenaries. Stand SW1 is also the home of six themed handling data projects called Real Data. The CD-ROM contains complete, real, relevant and easy to use data files and reduce the time and frustration students' experience when researching and compiling their own data source. For each project a Teacher's Planning Grid gives guidance on how to organise the projects.

Archie and the Dragon School is a new Clicker book from Crick Software (01604 671691) following on from the first in the series Daisy and Her Friend Thingy released last year. With the books come Clicker activities focusing on key literacy objectives. But Stand SN14 will also see a new version of ClozePro for teachers making cloze procedures and now offers


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Now you can access lectures from the world's best minds, courtesy of Boxmind (020 7495 4443). Their E-Lecture Collection features the likes of Professors John Kay, Susan Greenfield and Germaine Greer. You can subscribe to the collection individually or as an institution.

Assessment and reporting

Prime Principle are offering time saving software in the form of Classroom Monitor on Stand SW75. The aim is to create a tool to keep records and write reports and cut down primary teacher's workload, and to make better use of data collected during assessment. They have brought together the National Literacy and Numeracy Strategies, the National Curriculum, and end of year report generation into one ongoing assessment process.

Renaissance Learning UK (020 8804 0453) are launching StandardsMaster an instant assessment and web-based reporting software which allows education bodies to monitor schools in their region. A single class can be assessed as can a school or an entire Local Educational Authority. Try it out for yourself on Stand M83.

Hardware and accessories

The Big Keys Early Learning System (Stand SN60) has been designed by Key Tools (023 8058 4314) and is flexible enough that it can be used in nursery right through to Key Stage 2. Priced at £109 the keyboard layout can be changed to suit the user and their specific needs. In essence, this consists of a large format keyboard with a set of transparent, flexible plastic gloves which fit neatly over it which work without special, additional software. This means that the layout can be changed simply and quickly from QWERTY to ABC or opt for pictorial keytops with the added bonus that these gloves protect the keyboard from spills and sticky fingers!

MathAmigo from Valiant Technology is a way for delivering maths through handheld units used at the pupils' desks. There are three versions available: a colourful child-friendly device, however, you can opt to run the program on a range of palmtops via the Palm OS System or on AlphaSmart's Dana. It is easy to prepare activities, and spot strengths and weaknesses at a glance. Prices start at £35, ring 020 8673 2233 for more information.

DataHarvest (01525 373666) will be showing how their EasySense Flash Logger is now compatible with Tablet PCs. Stand L40 will also be home to The SOLO PIC Programming System, an easy-to-use interface that allows a PC to communicate directly with a PIC chip making electronic control systems easy for schools. From £79 Students can create a Flowol program, test it in realtime, download it into a chip and have a working Design Technology project complete with an electronic control system.

SEMINARS

Running alongside the exhibition, this year's seminars cover diverse areas from learning environments, inclusion, memory skills, speech recognition, and citizenship as well as subject specific ideas and support from Maths to Modern Languages. You can see what is on offer at **www.bettshow.com/visitor/seminars** and the seminar programme is a useful way of contributing to a teacher's Continuing Professional Development. Key speakers include Professor Stephen Heppel, Heather Du Quesnay, Dr Chris Singleton among others. Seats can be reserved online for a small fee.

Pam Turnbull
Pam@acornuser.com

COMPETITIONS AND AWARDS

Formula One in Schools

Secondary school students from around the UK have been set the challenge of designing the perfect Formula One race car by the experts at Jaguar Cars, BAE Systems and Denford Limited. Using Computer Aided Design software, finishing touches are being applied as the final challenge to find the winning teams will be held on 7 January. So who will have the fastest car? And who will have the best engineered design?

BETT Awards

The panel of independent judges are busy sifting through the nominations to ten categories: Online Learning Resources, Education Software - Early Years and Primary, Educational Software - Secondary, Special Education Needs - Primary, Special Educational Needs - Secondary, Further Education, ICT Hardware - Early Years and Primary, ICT Hardware - Secondary, Supporting School Management and finally the Innovation award. The winners will find themselves at the Awards Dinner on Wednesday 7 January.

SPECIAL EVENTS AND AREAS

Curriculum Software Advice Centre

Offer impartial evaluations on a wide range of curriculum and management software titles.

Policy in Practice

Will be home to experts from British Educational Communications and Technology Agency (BECTA), Qualifications and Curriculum Authority (QCA), Teacher Training Agency (TTA) and the National College for School Leadership (NCSL)

Association Village

Hosts subject teacher associations who will give hints and tips on how to incorporate ICT into specific subjects or areas from the Mathematical Association to the British Dyslexia Association.

Publishing Village

Is home to 40 ICT publishers of teaching and learning resources.

Special Needs Village

As well as the place to visit experts in special educational needs, there are also programs, accessories and services for you to see in action. There is also a range of SEN seminars running alongside the main seminar programme.

BECTA Internet Cafe

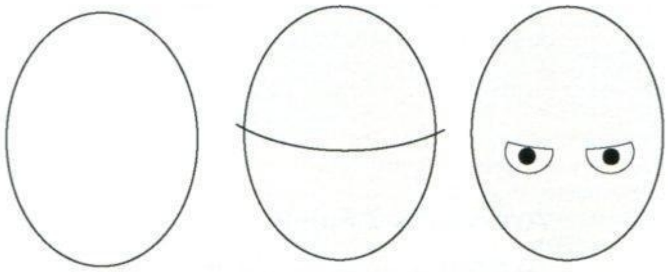
Visitors will have the opportunity to check their email and access online advice in an informal setting.

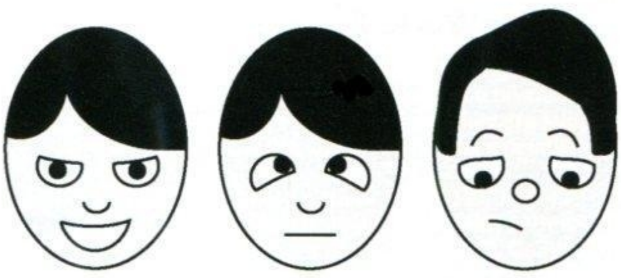

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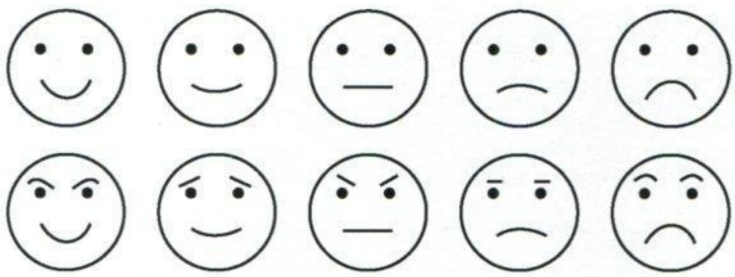
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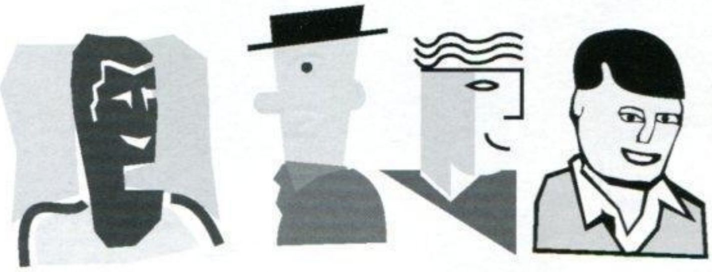
Face to Face, Head to Head

There may be times when you are required to draw a head or face. After all, we encounter the human face in casual or intimate communication several times a day. You would think that with such heavy exposure we'd learn a thing or two, but the fact is most of us simply take it for granted. Surprisingly, drawing faces can be one of the most difficult challenges, especially for those who are terrified of drawing. However, there are some tricks available which may make constructing heads and faces a little easier.









Let's start with a head. Human heads are egg-shaped, so you could start with an oval. You do not have to be Leonardo to create an ovoid shape which corresponds roughly with a head.For the eyes it's useful to draw a guide line. Most people would place the eyes in the top third of the oval, but actually they're located half way up, so draw a line which bisects the oval. Eyes can be drawn in many ways: realistically in almond shapes, or in cartoon-style shapes.In the example I've used the arcs of two more ovals to suggest an eye and an eyelid. Remember that certain features, such as the eyes, come in pairs, so once you've drawn one you could copy it and flip it. Another trick: there is about the width of one eye between each eye, so bear that in mind when placing the eyes on the face.

Place the mouth between the eyes and the chin. The edges of the mouth are usually in line with the middle of the eyes. Again I've used the arcs of two ovals to make the mouth, but you could use a simple straight or curved line.

From there build up the rest of the face, adding nose, hair, eyebrows, and so on. In a relatively short time you can create a simple drawing which may form the basis of a style. Facial expressions will be used to convey emotions or meanings, so it's good to explore a range. Exaggerate the expressions, experiment. Subtle changes can make a huge difference. In the "smilies", see how the way the mouth is drawn can affect the look of the face. The mouth gives the face life, adds an element of thought into its expression. The addition of eyebrows can change the face once again. The simple smile in the first face has taken on some rather cheeky, malevolent qualities. On the second face the eyebrows lend a kindly, hopeful quality. On the third, a melancholy thoughtful face has instantly become plain angry with its new eyebrows. And so on.

These simple elements carry an extraordinary amount of weight when it comes to giving a face life.Depending on how accurate you want your face to be, it may be worth remembering that, in reality, a face is never symmetrical. Isolate one side of of face in a photograph for example, and then the other, and they'll look remarkably different; some say that each face has an evil side and a good side. Or that one half of the mouth invariably goes down, the other goes up.However, because we all know the human face with such intimacy, it's not necessary to convey it with such strictness. In fact you can abandon any attempt at anatomical accuracy, and create what is still recognisably a head, but use your artistic licence to make it a little more interesting.

You can see by the smilies that you don't need very much to suggest a head and face: a circle, two eyes and a mouth will do it. Or you could discard the notion of circles or ovals and use angular, geometric shapes: squares, rectangles.

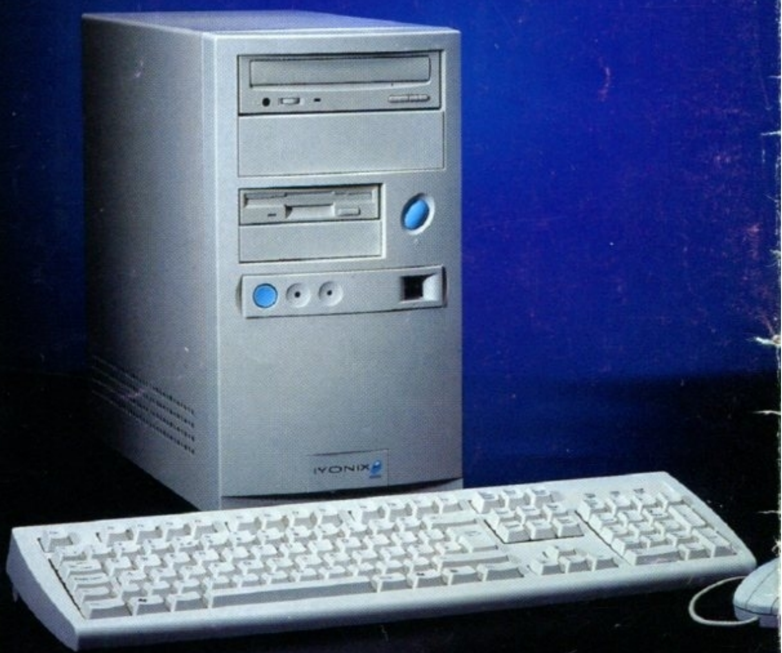
There is nothing as expressive as the human face. As I hope I've demonstrated, extremely subtle changes in the placement of features on a face can make huge differences in its character. Seemingly incidental elements such as eyebrows and hair simply add more life, more emotion, and more personality. As I say, there is nothing as expressive as the human face.

Nigel Gatherer
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